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QUEENSLAND.



# ANNUAL REPORT

OF

## THE COMMISSIONER OF PUBLIC HEALTH

TO

30TH JUNE, 1912.

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PRESENTED TO BOTH HOUSES OF PARLIAMENT BY COMMAND.

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BRISBANE:

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ANNUAL REPORT.

TO THE UNDER SECRETARY, HOME DEPARTMENT.

10th August, 1912.

SIR,—I have the honour to submit the following Report upon the work of the Department under my control for the year ending 30th June, 1912, together with certain comments and detail relating to the public health of Queensland.

I.—STATISTICAL.

The estimated mean population of Queensland at the end of 1911 was 614,352. Exclusive of full-blooded aborigines the census population on 3rd April, 1911, was 605,813. The total number of aborigines in the State is estimated by the Deputy Protector of Aborigines at from 15,000 to 20,000. The area of the State is approximately 670,500 square miles.

The crude birth-rate (births per 1,000 of mean population) for 1911 was 27.66, which is

higher than that for any year since 1902, and higher than that for the Commonwealth in 1911 (27.21).

The crude death-rate (deaths per 1,000 of mean population) was 10.65, showing a slight rise from the previous seven years. Crude death-rates depend so largely, however, upon age, distribution of population, and other factors that this rise is not to be taken as indicating any increased prevalence of disease or any relative inferiority of health conditions. The Queensland crude death-rate is slightly below that for the Commonwealth (10.66) for 1911.

The marriage rate per 1,000 of mean population was 8.41. This is higher than that of any previous year in the decade.

The following table, supplied by the Government Statistician, summarizes the principal vital statistics of Queensland for the last decade:—

SUMMARY OF PRINCIPAL VITAL STATISTICS OF QUEENSLAND FOR DECADE 1912-1911.  
(Furnished by Government Statistician.)

	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.
1. Estimated Mean Population ..	513,612	512,690	519,178	525,728	532,783	541,204	555,171	571,044	592,201	614,352
2. Number of Births ... ..	14,216	12,621	14,082	13,626	14,019	14,542	14,828	15,554	16,173	16,991
Rate per 1,000 Mean Population ...	27.68	24.62	27.12	25.92	26.31	26.87	26.71	27.24	27.31	27.66
3. Deaths under 1 Year ... ..	1,424	1,513	1,072	1,029	1,047	1,122	1,043	1,119	1,020	1,112
Rate per 1,000 Born ... ..	100.2	119.9	76.1	75.5	74.7	77.2	70.3	71.9	63.1	65.44
4. Deaths all Ages ... ..	6,204	6,346	5,250	5,503	5,095	5,599	5,680	5,530	5,145	6,544
Rate per 1,000 Mean Population...	12.08	12.38	10.11	10.47	9.56	10.35	10.23	9.68	9.70	10.65
5. Deaths in Public Institutions ...	1,693	1,761	1,452	1,661	1,565	1,744	1,796	1,705	1,865	...
6. Number of Marriages ... ..	3,243	2,933	3,078	3,173	3,588	4,105	4,009	4,542	4,769	5,169
Rate per 1,000 of Mean Population	6.31	5.72	5.93	6.04	6.73	7.58	7.22	7.95	8.05	8.41

INFANT MORTALITY.

The infant mortality rate for 1911 (deaths under one year per 1,000 born) was 65.44. This is a slight increase on the rate for 1910 (63.1), but with this exception it is the lowest for any year in the decade. The infantile death-rates for the past eight years show that the climatic and other conditions of Queensland are particularly favourable to infant life.

Compared with the infantile death-rates of other Australian States, that of Queensland for 1911 was second lowest, that of South Australia (60.5) being the lowest. Western Australia showed an infant mortality rate of 76, Tasmania 73.3, New South Wales 69.4, and Victoria 68.7 per 1,000 born. In 1910, Queensland showed a considerably lower rate (62.9) than any other State. Since 1904 inclusive her infantile death-rates, with the exception of one year (1909), have been considerably lower than those of Tasmania, a State which is frequently quoted as providing all the climatic elements required for healthy infant life, but which had in 1910 an infantile death-rate of 101.68, compared with 62.9 for Queensland. Since 1904 inclusive the infantile mortality rate for Queensland has never reached 80 per 1,000 born, a record which is only equalled by that of South Australia.

Compared with the rates of infantile mortality prevailing in other States and countries, that of Queensland is remarkably low, as is shown by the following table, compiled from the Official Year Book of the Commonwealth of Australia for 1901-1911:—

RATES OF INFANTILE MORTALITY IN VARIOUS COUNTRIES.

Country.	Year.	Infant Mortality Rate.
Queensland ... ..	1911	65.4
South Australia ... ..	1911	60.5
Victoria ... ..	1911	68.7
New South Wales ... ..	1911	69.4
Tasmania ... ..	1911	73.3
Western Australia ... ..	1911	76
Commonwealth ... ..	1910	75
Norway ... ..	1908	76
Ireland ... ..	1909	92
England and Wales ... ..	1909	109
United Kingdom ... ..	1908	118
Scotland ... ..	1908	121
France ... ..	1907	135
Japan ... ..	1908	157
German Empire ... ..	1907	176
Austria ... ..	1907	204
Chile ... ..	1908	320

It will thus be apparent that Queensland shows one of the lowest infantile mortality rates in the world, and has done so over a series of



years. This State has been so frequently misrepresented in this respect that it is time that her true position as one of the healthiest countries in the world for young children should receive the publicity which is its due.

#### POPULATION.

The recently issued Census Bulletins of the Commonwealth Statistician, dealing with the census taken on 3rd April, 1911, contain many interesting details relating to the population of Queensland, some of which may be here quoted. The total Queensland population, for which returns were obtained, exclusive of full-blooded aborigines, was 605,813. 446,695 of these were Australian born. Males numbered 329,506, and females 276,307. This relatively large preponderance of males is a normal and usual feature of an actively developing young country such as Queensland. In the metropolitan area of Brisbane these proportions are reversed, and females considerably exceed males in number. The males decrease markedly in proportion to females in the metropolitan area, after the age of 21, and increase in other parts of the State, showing the tendency of the young men to push out of the large centres.

The increase of population since 1901 (109,915 persons) has been 21.62 per cent., a higher rate than is shown by Victoria, South Australia, or Tasmania, but slightly lower than New South Wales (21.67), and considerably lower than Western Australia (53.22). The percentage of increase is lower, however, than that of either of the two previous decades. The net immigration into Queensland in 1911 was 12,673 persons, and the total increase 23,113 (Official Year Book, 1901-1911).

An interesting feature of the distribution of the population in Queensland is afforded by comparison with other States of the percentage of the total population located in the metropolitan areas of the capital cities. For Brisbane this percentage is 23, for Perth 39, for Sydney 42, for Melbourne 45, and for Adelaide 46. In Queensland, only 22 per cent. of the total State population under 21 years of age are located in the metropolitan area, whilst in New South Wales some 35 per cent. are centred in Sydney. Of the population aged 21 years and over 24 per cent. (78,169) of the total Queensland population at these ages are located in Brisbane, and over 40 per cent. of the total New South Wales population in Sydney. This appears to indicate for Queensland a sounder system of settlement of the country, the difference being mainly caused by the relatively large number of important extra-metropolitan centres of population which are so marked a feature of this State. Of the 605,813 persons returned for Queensland, some 466,333 are located outside the metropolitan area.

Queensland is occasionally referred to as containing a large Asiatic and Polynesian population. As a matter of fact, this State contains 2,644 fewer Chinese and Chinese half-castes than does New South Wales, and only 113 more than does Victoria. Western Australia has over 200 more Japanese than Queensland, despite the attention directed to Japanese labour in Torres Straits. New South Wales has more than twice as many Hindoos and Cingalese, Victoria also exceeds Queensland in this feature, and Western Australia has approximately the same number of

these races as Queensland. Polynesians have been reduced, mainly by compulsory deportation, from 9,327 in 1901 to 2,265 in 1911.

The census figures for these races in Queensland are as follows:—Chinese and Chinese half-castes, 6,714; Japanese, 1,503; Hindoos and Cingalese, 643; and Polynesians, 2,265.

The censal age distribution for Queensland (both sexes) for 1911 was as follows:—

Age Last Birthday.						Number Returned (both sexes).
0—4 years	...	...	...	...	...	73,704
5—9 "	...	...	...	...	...	63,486
10—14 "	...	...	...	...	...	62,449
15—19 "	...	...	...	...	...	63,536
20 "	...	...	...	...	...	13,156
21—24 "	...	...	...	...	...	49,851
25—29 "	...	...	...	...	...	52,561
30—34 "	...	...	...	...	...	43,734
35—39 "	...	...	...	...	...	38,149
40—44 "	...	...	...	...	...	34,693
45—49 "	...	...	...	...	...	31,015
50—54 "	...	...	...	...	...	24,721
55—59 "	...	...	...	...	...	16,627
60—64 "	...	...	...	...	...	12,392
65—69 "	...	...	...	...	...	10,049
70—74 "	...	...	...	...	...	7,050
75—79 "	...	...	...	...	...	3,514
80—84 "	...	...	...	...	...	1,364
85—89 "	...	...	...	...	...	468
90—94 "	...	...	...	...	...	102
95—99 "	...	...	...	...	...	19
100 and upwards	...	...	...	...	...	5
Unspecified	...	...	...	...	...	3,166

It is interesting to note that Queensland returns five centenarians.

#### II.—GEOGRAPHICAL RELATIONSHIPS. OF QUEENSLAND.

The geographical position of Queensland renders this State the natural gateway from Far Eastern Asia and its dependencies to Australia. For this reason, particularly, organised sanitary effort is especially necessary, and unless both our external and internal lines of defence are constantly developed and constantly maintained in a condition of efficiency for instant active service against epidemic disease, we will be liable to serious disaster.

During the year under review our internal defences have been materially strengthened by the establishment of the Northern Sub-office at Townsville, with a trained staff working under a Medical Inspector. The vaccination work carried out amongst the Torres Straits Islanders in April and May has also reduced the risk from smallpox introduced through or from New Guinea. The passage of "*The Health Act Amendment Act of 1911*" has furnished the Department with much-needed powers for summary action against epidemic disease, and has enabled the epoch-making discoveries of the past decade, in respect of insect-borne disease, to be applied in a direct and definite manner should the occasion arise. These advances are matter for satisfaction to all who have at heart the best interests of Queensland, but they do not comprise, by any means, all that is required.

It is of great importance that the country should be in a position to grapple with epidemic disease, should it gain entry, but it is even more important that the conditions which permit and even invite such disease should be removed. The *Stegomyia fasciata* mosquito, conveyer of yellow fever, once it becomes infected from a human



case, is a common domestic insect in our coastal cities and towns, and requires to be attacked vigorously lest infection is some day introduced. The water supplies of several of our cities need better protection against the risks of cholera and tropical dysentery. The larger centres of population are not yet provided adequately with isolation accommodation for infectious diseases, and much requires to be done in respect of local sanitary organization. Drainage schemes are also needed in several of our larger cities which have grown beyond the capacity of pan-services. Neglect of vaccination lays our people open to risk of smallpox, that terrible scourge from which Australia alone amongst the continents of the world is free, but which is always knocking at our doors. No maritime quarantine service, however efficient, will keep out exotic diseases with certainty, and it is obviously wise to use our best endeavours to prevent them from getting a foothold. Canada and South Africa are paying a heavy penalty for permitting in the past the introduction and spread of smallpox and other epidemic diseases.

Queensland is, to-day, one of the healthiest countries in the world, and it is well worth while to deliberately invest a considerable annual outlay of State and municipal funds to keep her so.

It was pointed out in the Annual Report for 1910-1911 that the smallpox-infected Aru Islands are within 600 miles from our northern coast, and that a smallpox-infected person might easily, and at any time, be landed in one of our principal northern ports from the Spice Islands, Celebes, Borneo, Manila, Timor, or Java, within the twelve-day incubation period of smallpox.

As a case in point, a saloon passenger on the "Yawata Maru" from Japan and Hong Kong, arrived at Thursday Island on 22nd May in apparently robust health. After a brief visit to the island she rejoined the ship, which proceeded on its voyage south. Next day this passenger developed the first signs of commencing smallpox, and the vessel was put into quarantine on arrival at Townsville. Had the passenger been booked for Thursday Island, it would have been well nigh impossible to avoid local infection.

This happening illustrates one inherent weak point in maritime quarantine of vessels arriving from infected places within time-distance range of the long incubation period of smallpox, and indicates the necessity for adequate development and maintenance of internal measures of sanitary defence.

Smallpox is not our only danger, however, for the existence of "carriers" of cholera and dysentery has to be taken into account. During the recent European cholera outbreak, 27 apparently healthy "carriers" of cholera were discovered and isolated on arrival from Europe by the Quarantine Service at New York, and 41 others were prevented from sailing from Italian ports. Cholera is endemic in the dependencies of Asia which lie so close to our shores.

### III.—COMMUNICABLE DISEASES.

#### NOTIFICATIONS.

The statutory defects in respect of notification of infectious diseases referred to in the Annual Report for 1910-11 have been removed by the passage of "*The Health Act Amendment Act of 1911.*" A new form of notification was

introduced in January, and has already yielded valuable results in enabling more precise information to be gathered concerning the apparent influences of school contact, of house contact, and of removal to hospital. It will be also now possible to collect definite observations upon house infection from cases, a question of much practical importance in connexion with estimating the necessity or otherwise for special isolation accommodation and for elaborate disinfecting arrangements. The new form has also placed more definite information at the disposal of Local Authorities, and has put them in a much better position than formerly for dealing with outbreaks at the inception. The total cases notified for each proclaimed disease are shown in Appendices 14 and 15.

#### TYPHOID FEVER.

Although Queensland cannot be described as heavily infected by this disease during the year under review, it is at all times an economic factor of considerable importance. A low estimate of the cost per case is £12. The cases notified during the year numbered 1,501. Typhoid fever affects especially people at the best working ages, and both for this reason and because of the long period of disablement which it causes it is a peculiarly costly and uneconomic disease. The direct outlay which has had to be incurred on its account by individuals or the State thus amounts to some £18,000 for 1911-12.

Is there any practicable way of reducing this large and unnecessary drain upon the resources of the people and of the State? We know that typhoid fever is spread by infected discharges from the bowels and kidneys of human beings, which contain the specific organisms of the disease. These are swallowed by the victim, and if his bodily powers of resistance are not sufficient to overcome the introduced infection the disease is set up in his body after a varying period of incubation. It matters not how the infected material is conveyed—whether by water, by milk, by raw vegetables, or by icecream, whether it is taken in directly from infected fingers or whether it is carried by filth-smearing flies—the cause of an attack of typhoid is the eating or drinking of the faeces or urine of some infective person. The views of fifty years ago, ascribing the origin of typhoid fever to smells, to sewer gas, or to dirty backyards or ill-kept streets, are still quoted freely by Press and public alike, but have been shown by direct observation to be destitute of foundation. Typhoid does not originate outside the human body, and in practice it is not spread otherwise than by swallowing infected human discharges.

Ordinary cleanliness and reasonable care might be regarded as efficient safeguards. Unfortunately these are not sufficient for absolute protection. Intestinal bacteria are not infrequently present on the hands of ordinarily cleanly people, particularly after using the closet. Many persons who are entrusted with the preparation of food for others cannot be described as ordinarily clean people. The average cook certainly does not habitually wash the hands after using a closet. Flies, too, are effective and rapid conveyers of faecal matter from closets to food, if the former are accessible and the latter unprotected. The fly-path from the closet-pan to the milk-jug is usually short and straight.



The "carrier" introduces a fresh factor into the typhoid question. By a "carrier" is meant one who excretes typhoid bacilli in the faeces or urine without showing symptoms of the disease. There may or may not be a history of a previous attack of typhoid fever. The "carrier" condition may last for years, and, as yet, no method of curing it has been devised. Mild cases, such as often occur in children, have also to be considered, and are certainly responsible in part for the spread of the disease. "Carriers," if detected, can be controlled under the present law, and, if need be, isolated for the public safety. In practice, however, they can rarely be detected until they have caused an outbreak.

It is clear that in typhoid fever we have to deal with an elusive and difficult condition, from the standpoint of preventive action. Bacteriological science has provided what appears likely to be a partial solution of the problem, in the shape of a preventive vaccine. Dr. Harris, in his report on the Laboratory of Microbiology and Pathology, summarizes some of the recent observations and results on anti-typhoid inoculations. From a study of official records he points out that in the British Army in India during 1910 the typhoid rate amongst the uninoculated was about six times as great as amongst soldiers who had been inoculated against typhoid. In the United States Army, amongst 60,000 inoculated men there were only 12 cases of typhoid in three years, with no deaths. An army division of 12,800 inoculated men had one case in a partly inoculated man in four months. Another division, numbering 10,750 men, which had occupied the same camp four years previously under much the same conditions, excepting inoculation, had had 2,693 cases of typhoid with 248 deaths. The local reaction is comparatively slight, and cannot be compared with that of vaccination. The protective power persists for at least two years, and probably considerably longer. There has not yet been time to prove the actual duration of protection.

During the year under review at least one new and virulent "strain" of typhoid has been imported by immigrants, and has produced a much severer type of disease. Under present conditions this experience is likely to be repeated, and either by local exaltation of virulence or by importation of a new and virulent "strain" of the specific organisms in the bodies of carriers or mild cases, severe and widespread outbreaks may be caused unless active means are taken to minimise the risk. Much improvement has been effected of late years in the management of night-soil services. Recent legislation will enable further necessary steps to be taken in this direction. These procedures are necessarily somewhat slow of development, and more expeditious means are desirable where an actual outbreak has to be met.

The most practical and expeditious beginning which can be made in attacking the typhoid problem on a large scale appears to lie in attempting to secure preventive inoculation of persons exposed to infection. Observations are now being carried out at the Laboratory of Microbiology and Pathology with a view to the manufacture of an anti-typhoid vaccine, and it is anticipated that a fully-tested local vaccine will be available before the coming summer.

## DYSENTERY.

In consequence of a recrudescence of tropical dysentery in certain of the Torres Straits Islands, this disease has been made notifiable in the Thursday Island area. Regulations for its control were also put in operation.

The incidence was chiefly upon the coloured races of the Straits Islands, and considerably fewer cases are reported to have occurred than in the previous year. Prompt action taken by the Government Medical Officer (Dr. J. L. Wassell) and by the Local Authority of Thursday Island enabled the outbreak to be controlled in that area, but the occurrence is significant of the necessity for systematic sanitary supervision and regulation of the considerable native population of Torres Straits as a measure of protection against the spread of cholera should it gain entrance from the endemic and epidemic centres in Eastern Asia and its geographical dependencies.

## PHTHISIS.

Comparative figures for 1911 are not available, but in 1910 both the death-rate in Queensland from tuberculosis (0.59 per 1,000 of mean population) and the percentage of deaths from tuberculosis, calculated on total deaths (6.06), were considerably lower than in any other State. The following table, extracted from the Official Year Book of the Commonwealth of Australia, No. 5, gives the comparative figures for tuberculosis in the different Australian States:—

STATE.	* DEATH RATES FROM TUBERCULOSIS.			PERCENTAGE ON TOTAL DEATHS.		
	Males.	Females.	Total.	Males.	Females.	Total.
New South Wales ...	0.80	0.70	0.75	7.34	8.01	7.62
Victoria ...	1.05	0.90	0.97	8.22	8.83	8.49
Queensland ...	0.74	0.40	0.59	6.68	5.02	6.06
South Australia ...	0.95	1.04	0.99	8.68	10.96	9.72
Western Australia ...	1.03	0.63	0.86	9.03	7.55	8.50
Tasmania ...	0.67	0.96	0.81	5.92	8.81	7.31
Commonwealth ...	0.89	0.76	0.83	7.69	8.26	7.93

\* Number of deaths from tuberculosis per 1,000 of mean population.

It is especially satisfactory to note that the tuberculosis death-rate for both sexes in Queensland was less than three-fourths of that for the Commonwealth for that year, as the Commonwealth rate is one of the lowest in the world. The tuberculosis death-rate in England and Wales in 1906 was 1.65; in the German Empire in 1905 it was 2.04; and in Switzerland in 1905 it was 2.72.

Despite this satisfactory position of Queensland at the present day, an expenditure of over 300 lives per annum from an entirely preventable disease cannot be regarded with indifference. The actual monetary loss incurred for each case of consumption is at the least £30, and the annual bill for Queensland is thus some £10,000, apart from the value of lives lost. Two-thirds at least of the deaths from phthisis are amongst people of between 15 and 50 years of age, or, in other words, they occur in the most useful and productive period of life. At these ages any long-continued disabling illness produces the maximum of misery and poverty, and phthisis is thus a peculiarly uneconomic factor in the social problem owing to its capacity for disabling its victim for several months before it kills.



From time to time it is alleged that Australian consumption death-rates are heavily increased by deaths of persons sent out for their health from Europe. That this is not the case is apparent from the fact that in 1910, out of 3,617 deaths from tubercular diseases in Australia, 2,639 were persons born in the Commonwealth, and only 100 had been resident for less than four years (Official Year Book, No. 5). There is no doubt that the great bulk of our consumption death-rate is the result of local infection.

It is possible by intelligent effort to prevent this unnecessary and heavy toll on life, health, and prosperity. The first essentials required in a definite campaign against consumption are adequate provision for housing and looking after advanced cases (preferably in the form of annexes to existing hospitals), and adequate sanatorium provision for cases in the curable stages. All necessary statutory powers likely to be required at the outset are already available from "*The Health Acts, 1900 to 1911.*" The most pressing need at present, so far as the control of pulmonary tuberculosis is concerned, is that of more extended accommodation for advanced cases.

#### DIPHtheria.

The incidence of diphtheria, especially in Southern Queensland, has been markedly higher during the year under review than during 1910-11. Fourteen hundred and ninety-six cases of diphtheria and eight of membranous croup have been notified. This appears to have been due to an epidemic wave, spreading from the Southern States. Children have, as usual, provided the great bulk of notified cases, and the effect of school spread has been evident. School contact forms a prominent factor in the spread of diphtheria, owing to the facilities offered by them for infection from "carriers" and mild cases amongst the children. Closure of the school is of little avail unless persisted in for a long period, as the unrecognized infectious individual will return and will continue to infect others. In addition, closure of a town school merely scatters the children out of reach of medical enquiry, without lessening to any material extent the risk of infection.

The widespread, but entirely incorrect, idea that diphtheria is "bred" from drains and insanitary conditions generally, is the principal stumbling block in the road of suppressive measures against this disease. In place of obtaining prompt medical advice, and enlisting the assistance of the Department's Laboratory for the free supply and free examination of swabs from all contacts and suspects, valuable time is frequently wasted in futile attempts to discover a hypothetical source of infection in some adjoining drain. The relationship between human contact and association and the spread of diphtheria is so obvious and well proven by direct bacteriological observation that there is no need here to bring forward fresh evidence to indicate that the ordinary and everyday method of spread is directly from the infected to the healthy person, without any extraneous intervention. No evidence whatever exists to show that drains or nuisances have anything at all to do with its spread. The prejudices of sixty years die hard, however.

The only rational or effective method of attacking a diphtheria outbreak in a school, a

house, or a neighbourhood, consists in carefully locating all houses and suspected cases, and all contacts; obtaining swabs from the throats of these persons; and examining these swabs bacteriologically for virulent forms of the specific bacillus. A large stock of swabs is constantly maintained at the Department's Laboratory, and supplies will be sent free of charge to any medical men or any Local Authority applying for them for use in connexion with a diphtheria outbreak.

"*The Health Act Amendment Act*" has provided for several important matters in connexion with communicable diseases amongst school children, and in particular has furnished the necessary powers for enabling medical officers of health and authorized medical practitioners to enter houses from which children attend school and to examine the persons therein.

#### ANKYLOSTOMIASIS.

Only 31 cases of this disease have been notified during the year under review. Of these 7 were from the metropolitan area.

If due weight is to be placed on the statements of experienced observers in Northern Queensland, the true condition of affairs must be greatly understated by this return. The disease does not appear, so far, to have wrought any serious or permanent racial damage in Queensland, and extensive personal observations on children in many Northern localities have failed to show evidences of physical or moral deterioration of the kind recorded by Stiles, Dock, and other American observers in certain of the Southern United States.

Before the question can be settled extensive and detailed enquiry will be needed. The recent extension of the staff and scope of the Australian Institute of Tropical Medicine is to be welcomed in this connexion. The establishment of the Northern Sub-office at Townsville, and the extension of the medical inspection of schools system to the North also afford further opportunities for enquiry into a subject which is of very material importance to the national welfare of Queensland.

#### DISINFECTION.

Disinfection of premises from which cases of infectious disease are notified has continued to be performed by an officer of this Department for 15 of the 20 Local Authorities in and about Brisbane. One Local Authority (Kedron) withdrew from this arrangement.

Nine hundred and eighty-nine premises were disinfected during the year under review, the cost being recovered from the Local Authorities on whose behalf the work was done.

Disinfecting work has also been performed for the assistance of the Home Secretary's Department in cases of leprosy, of the Department of Public Instruction in connexion with infectious diseases in schools, and for the Department of Railways. An extensive series of observations on the carbolic coefficient of various commercial disinfectants has been carried out at the Department's Laboratory, with a view to ascertaining their relative efficiency by the Rideal-Walker test and their economy in usage on the "Lancet" method of calculation.



#### IV.—PLAGUE AND RAT-DESTRUCTION.

It is again possible to review a period of twelve months during which no case of plague has been reported in either human beings or rats. This is, in my opinion, largely ascribable to unremitting persistence in the work of destroying and examining rats in the principal coastal centres. Plague is still widely spread in Eastern Asia and its dependencies, and, although no definite connexion has been discovered between rats and the great outbreak of pneumonic plague in Manchuria last year, the occurrence serves to remind us that the pandemic spread of plague in one or other form is by no means outside present possibilities. No relaxation of the measures for rat destruction can be safely made.

During the year over 62,000 rats and mice were destroyed and 27,300 carcasses were submitted for examination at the Department's Laboratory. 1948 spleen smears from rats at Mackay and Townsville were also examined. 18,208 carcasses were examined at other centres for signs of plague.

The detailed results are shown in Appendix 9.

Systematic enquiry has continued to be carried out in the metropolitan area, with a view to ascertaining the conditions of food supply and harbourage on private and business premises.

The results for 1,278 premises, business and private, were as follows:—

RAT INFESTATION, BRISBANE.

	BUSINESS PREMISES.		DWELLINGS.		TOTAL.	
	No.	%	No.	%	No.	%
Recent traces of rats ...	178	54	188	20	366	29
Access from drains and sewers	39	12	34	4	73	6
Rat-harbourage ...	162	49	384	41	546	43
No access under buildings	155	47	262	28	417	33
Edible refuse unprotected	57	17	123	13	180	14
No garbage tins ...	20	6	22	2	42	3
Garbage tins uncovered	78	24	172	18	250	20
Number of premises examined	331		947		1,278	

It is clear from this and from the relatively small reduction secured year by year, as shown by the numbers killed, that the rat reduction problem is not to be solved by destruction measures alone. A rat-free city is a plague-free city so far as the bubonic and probably the septicæmic forms of plague are concerned. In Brisbane and the principal towns of Queensland the absence of means for preventing the careless or apathetic householder from providing food and harbourage for rats has hitherto enabled these animals to repair the losses sustained from the destruction-measures carried on by the officers of this Department and of those few Local Authorities who co-operate in the work by employing rat-men. This condition of affairs is obviously uneconomic, but prior to the passage of "*The Health Act Amendment Act of 1911*" no legal method was available for remedying it.

In May, 1912, an Order was made by the Governor in Council (see Appendix 9C) declaring rats to be noxious vermin, and specifying measures to be taken for their destruction under Section 132F of the amended Act. This Order was applied to the metropolitan area of Brisbane. It is now being steadily brought into

operation with a view to remedying the conditions which favour the increase of rats. Should its operation in Brisbane prove satisfactory, the Order will be later submitted for extension to other principal urban centres in Queensland.

Examples of some of the existing conditions favouring rat-infestation in the metropolitan area are shown in the accompanying photographs. Whilst such rat-fortresses are permitted to remain under and about houses it is obviously impossible to eradicate the vermin.

#### V.—LEPROSY.

This disease is controlled in Queensland by a special Act ("*The Leprosy Act of 1892*"), administered by the Home Secretary. Leprosy is included as a quarantinable disease under "*The Quarantine Act of 1908*" of the Commonwealth, and leper lazarets are thus brought within the scope of Federal action.

The Peel Island lazaret was proclaimed in November, 1910, as a quarantine area under the Federal Quarantine Act, and regulations controlling ingress and egress of persons and things were put into operation. By mutual arrangement the management of the lazaret was taken over tentatively by the Federal Quarantine Service early in 1912. Dr. Moore, Health Officer of this Department, was appointed from March as visiting medical officer.

A table of cases appears in Appendix 16. Seventy-three cases were under treatment during the year, and 57 remained on 30th June, 1912. Four new cases were admitted, and 13 died. Three were discharged under surveillance, no active evidence of leprosy being found on examination; 23 were classified as nodular leprosy, 41 as tuberculo-anaesthetic, and 9 as anaesthetic leprosy.

Of the cases admitted during the year, one was nodular leprosy, and the remaining three tuberculo-anaesthetic. One case was transferred from Friday Island, one came from Mackay, one from Miriam Vale, and one from Mount Morgan. One was a Queenslander of European descent, one Irish, and two were Kanakas.

The races and nationalities of patients comprised 18 Queenslanders of European descent, 2 from New South Wales, 2 English, 1 Irish, 1 Scotch, 2 European other than British, 1 Japanese, 3 Chinese, 1 Cingalese, 13 aboriginals, 5 half-caste aboriginals, 23 Kanakas, and 1 Kanaka half-caste.

Of the surviving cases 1 has been segregated for fourteen years, 2 for twelve years, 1 for ten years, 3 for nine years, 3 for eight years, 2 for seven years, and 8 for six years.

#### VI.—NORTHERN OFFICE.

The Northern office of the Department was formally opened on 18th January under the charge of Dr. J. Booth Clarkson, L.R.C.P. Edin. D.P.H. D.T.M.H. (Camb.), Medical Inspector for North Queensland. Three certificated sanitary inspectors were appointed, and after a preliminary period of duty in this office were transferred to Townsville. The establishment of the Northern office has considerably relieved the situation in respect of risks from epidemic disease in North Queensland, in that it will





DISUSED SEWER—RAT INFESTED.



SHOWING RAT INFESTATION UNDER FLOOR OF DWELLING.  
DISUSED SEWER (RAT INFESTED) FILLED IN UNDER HOUSE.









RAT INFESTED STONE WALL.



DEMONSTRATING VACCINATION—SAIBAI ISLAND.







enable prompt action to be taken in emergency from a point 700 miles nearer to the scene of action. In addition, it will enable the Health Acts to be operated and enforced in North Queensland in a way that would otherwise be impossible.

Dr. Booth Clarkson's appointment for some three months as Deputy Commissioner interfered to some extent with the early development of the work, but, as will be evident from perusal of his report (Appendix I.), a very useful beginning has been made. A curious position arose at Townsville during the labour troubles, owing to failure to elect a mayor, and Section 172B of the Health Acts was found exceedingly valuable in enabling certain administrative difficulties of local sanitation to be dealt with by the town clerk.

#### VII.—LABORATORY OF MICROBIOLOGY AND PATHOLOGY.

The scope and nature of the work performed at the Department's Laboratory will be apparent from the Report of the Director (Dr. J. J. Harris, M.B., D.P.H.), appearing in Appendix 3. Some 30,514 specimens were examined during the year under review, and the time-consuming work of the Laboratory increased by some 50 per cent.

The Laboratory has been re-equipped at an expenditure of over £500, and is now in a position to undertake a wide range of microbiological and pathological work. All work for charitable institutions, for Government Medical Officers, Government Health Officers, and Medical Officers of Health in connexion with their official duties is carried out free of charge, as are examinations of diphtheria swabs, sputum for tubercle, and faeces, urine, or blood for the diagnosis of typhoid fever. A revised scale of charges for specimens examined for medical practitioners and others, covering cost of material and officers' time, received Ministerial approval in 1911. A printed circular enclosing instructions for preserving and forwarding specimens has been sent out to all medical practitioners in Queensland, and diagnostic outfits for diphtheria and typhoid fever have been made up for distribution.

A well-equipped microbiological laboratory is an indispensable portion of any organization directed against communicable disease. That of this Department is not only available for Departmental requirements, but is without charge at the service of every Local Authority through their Medical Officer of Health, and, in respect of diphtheria, typhoid fever, and consumption, of every medical practitioner in the State. This fact does not seem to be sufficiently well realised, judging from the disappointing number of specimens sent in during the year under review. The Laboratory is also available for school medical inspection work, and a considerable number of throat swabs have been examined in connexion with diphtheria enquiries conducted by the Medical Inspector of Schools.

The remarkable developments which have taken place in microbiology during the past decade have rendered the assistance of the laboratory worker essential to the executive sanitary officer. The accurate and conclusive diagnosis of most of the great epidemic diseases, the tracing out of the actual sources and modes by which

diseases spread, and the practical testing of preventive measures against such spread, are matters for the microbiologist, but they represent the very basis of effective sanitation. One principal object in the organization of the Department's Laboratory on its present lines has been that of enabling medical officers of local sanitary organizations to have at their disposal in their official work the resources of a modern bacteriological laboratory. So far the response has been disappointing, but it is to be hoped that as interest in practical sanitation, as apart from hypothesis and guesswork, grows amongst Local Authorities, the scientific facilities which are so freely extended to them will be taken advantage of in the interests of the community.

#### VIII.—FOOD INSPECTION AND FOOD ADULTERATION.

The passage of the Food and Drug sections of "*The Health Act Amendment Act of 1911*" has placed Queensland fully on a level with other Australian States in respect of powers for the regulation of food purity. It is difficult to conceive any other law which is capable of being made to exercise such a universally beneficial effect upon the people of Queensland. This fact appears to be well recognized by the community. The extensive mercantile interests affected by the new legislation offered no opposition to its passage, and an evident desire exists in the mercantile community to aid cordially in securing its efficient working. The passage of the Act and the subsequent framing of Regulations and standards necessitated discussion of many technical and trade questions, and some twenty representative deputations, in addition to many single representatives of firms, have been met in connexion with various aspects of the Statute and Regulations. With one exception, relating to the importation and marking of boots and shoes, it has been possible in most cases to arrive at mutually satisfactory conclusions. Suspension of Sections 100A (iii.) and 100B for a limited period pending further enquiry has been necessitated by the strong representations submitted by the Boot and Shoe Retailers' Association as to the injurious effect likely to be exercised by these sections, if enforced, upon the retail shoe trade.

Uniformity of standards and of manufacturing requirements in the different States is much needed. In recognition of this want the second Interstate Conference on Uniform Food Standards, which met in Sydney in September, 1911, recommended that Dr. Ashburton Thompson should be appointed as a Royal Commissioner for each State in turn, for the purpose of reducing to a common factor as many as possible of the varying and conflicting details of State laws and regulations which stand in the way of this desirable arrangement. The recommendation was adopted, and it is anticipated that the present difficulties and inconveniences will be largely removed in the course of the ensuing year by the convocation of a third Interstate Conference to deal finally with the matters in the light of Dr. Thompson's enquiries.

The tables appearing in Appendix 10, 11, and 12, together with the Report of the Government Analyst (Appendix 4), will indicate the work done in securing food-purity, so far as limitation of staff has permitted. Over 116



tons of unfit foodstuffs were seized and destroyed in the metropolitan area, and over 8 tons in country districts. Over 16 tons were seized and destroyed by the inspectors of the Townsville Sub-office since January, 1912.

The premises of 49 bakers were visited for bread-weighing work under Part VI. of the Health Acts, and seven bakers were prosecuted for light-weight bread. Of these one was in Mount Morgan, one at Dalby, one at Bundaberg, and four at Laidley. All prosecutions were successful, and a total sum of £22 3s. 8d. was allowed in fines and costs.

The number of milk samples purchased for analysis (265) is more than double those of 1910-11, and over 100 more than those of any previous year. In addition to the metropolitan area, milk sampling was undertaken at Beenleigh, Bundaberg, Ipswich, Laidley, Mount Morgan, Rockhampton, and Sandgate. Prosecutions were necessary at all these places. The percentage of legal samples found to be adulterated (26 per cent.) is higher than for the last year (23 per cent.), but this is probably due to the more extended use of the freezing point test, which enables added water to be detected with greater accuracy than is possible with chemical analysis. This test provides a valuable and conclusive means of protecting both the public and the dairyman. Some interesting illustrations of its accuracy and reliability are given in the Report of the Government Analyst (Appendix 4).

The percentage of added water in samples ranged from 2 to 59 per cent., and averaged 12 per cent. The Government Analyst points out that if the adulterated samples are taken as fairly representative, the public of Brisbane is paying at the rate of over £5,200 a year for water in the guise of milk. As the average composition of the samples of milk tested was well above the standard fixed by Regulation, this sum may reasonably be regarded as a minimal estimate.

Fifty-two samples of milk were taken at town railway stations on arrival from country dairies. Six contained added water, averaging 6 per cent. This indicates that, although most of the adulteration is done after the milk leaves the station, the original producer is not always innocent. The guarantee provisions of the Health Acts enable protection against fraud of this nature to be secured by consignees. The fat content in all was above the legal standard, and ranged from 3.5 to 6.2 per cent. The fat content in half the samples was above 4 per cent.

Forty-five prosecutions were undertaken for adulteration or deficiency in respect of milk, and one for refusal to sell. All were successful. The total fines and costs imposed in milk cases amounted to £428 5s., but, as the Government Analyst points out, this still leaves a very wide margin of profit for dishonest vendors.

It is hoped that systematic inquiry into the dirt content of market milk will be possible during the coming year, and that some mitigation of existing conditions will be secured. Endeavour is also being made to check the insanitary practice of plugging can lids with rags, which not infrequently have been found to consist of old underclothing.

The number of legal samples of food taken during the year was 328. This included 265 samples of milk, 13 of cream of tartar, 4 of pepper, 10 of summer drinks, 9 of cordials, 3 of butter, 3 of coffee, 2 of tea, 2 of potted meats, 6 of sausage and mincemeats, 2 of vinegar, and one each of condensed milk, milkine, golden syrup, and tinned peas.

The ratio of samples to population usually regarded as required for efficient supervision of food purity is three to each thousand of population per annum. Despite special effort it has not been possible to reach even one-third of this standard in the absence of a special staff for food work. Moreover, under the far-reaching and drastic powers conferred by Part VI of "*The Health Acts, 1900 to 1911*," far more is required than mere sampling and prosecution. This Act has placed the department in practical direct control of very large manufacturing and retailing interests, amongst most of which there is a high standard of commercial morality. Given the necessary staff, the detection and punishment of deliberate adulteration will now be a relatively simple problem; but there is now, also, the added duty of improving existing methods where necessary, and of avoiding unnecessary harassing of trade interests where no detriment to the public is involved. These factors require an adequate and skilled executive, specially trained in all matters relating to food inspection work.

#### IX.—SEA QUARANTINE.

Maritime quarantine has continued to be administered under "*The Quarantine Act, 1908*," the Commissioner of Public Health acting as Federal Chief Quarantine Officer General. Thirteen medical quarantine officers are located at Brisbane, Bundaberg, Maryborough, Gladstone, Rockhampton, Mackay, Bowen, Townsville, Innisfail, Cairns, Cooktown, and Thursday Island respectively. An inspector of shipping and fumigation does duty at Brisbane, and the rat destroyers at Bundaberg, Cairns, Maryborough, Mackay, Rockhampton, and Townsville act as ship fumigators when required. A new Federal landing station for cases and contacts is in process of construction at Thursday Island. Colmslie Isolation Hospital, on the Brisbane River, was proclaimed temporarily as a quarantine station in connection with the quarantine of the s.s. "*Van Linschoten*," in August, 1911.

Six vessels from Asiatic ports have been quarantined during the year in connection with smallpox. One required attention for bubonic plague. One other vessel reported a case of smallpox which had been landed at an Asiatic port, where all necessary measures had been taken. Some fifty contacts from the s.s. "*Van Linschoten*" were quarantined at Colmslie in August, 1911.

The joint arrangement whereby maritime quarantine is administered from this department on behalf of the Federal Quarantine Bureau has worked smoothly. The limitations of maritime quarantine as a practical safeguard against the introduction of epidemic diseases have been elsewhere alluded to. It is always liable to be forced or evaded by incubating cases, and the real lines of defence are to be found in the organisation and powers available to deal with such diseases after they have obtained a footing on shore.





MURRAY ISLANDERS—PASI (MAMOOSE) ON LEFT.



GANGOSA—DAUAN ISLAND.









NEW STYLE OF VILLAGE—SAIBAI ISLAND.



OLD STYLE OF VILLAGE—BALU ISLAND.









HOUSE IN COURSE OF CONSTRUCTION—SAIBAI ISLAND.



COUNCIL AND POLICE—BADU ISLAND.







## X.—REGISTRATION OF NURSES.

The provisions of Part VIII., of "*The Health Acts, 1900 to 1911*," in respect of registration of nurses, were complied with by the formation of a Nurses' Registration Board. The medical members appointed by Executive minute dated 22nd February, 1912, were Dr. A. C. F. Halford, M.D., B.Sc., Dr. J. McLean, M.D., B.S., and Dr. H. Byam Ellerton, Inspector General of the Insane. The first meeting was held at this office on 4th March, 1912. A secretary was appointed, and suitable office accommodation obtained for the work of the board. A technical legal difficulty arose owing to the wording of the Act in respect of the nomination of nursing representatives, but was got over by including, as eligible for nomination within the meaning of the Acts, all duly enrolled members of the Queensland Branch of the Australian Trained Nurses' Association. This was accordingly effected by registration, and enabled the formal constitution of the Board to be proceeded with.

Twelve meetings have been held, 277 applications for registration have been received, and fees amounting to £138 10s. paid in. Of the applicants 151 were general nurses, of whom 126 held general nursing certificates entitling to registration, and 122 held midwifery hospital certificates entitling to registration.

Although the provisions of the Acts do not render registration compulsory for nurses, they enable the public to identify the fully trained nurse, and tend to constantly improve the standard of training.

## XI.—STAFF AND WORKING.

At the close of the year under review the headquarters staff consisted of a Health Officer, a secretary, three clerks, a typiste, a cadet messenger, a chief inspector, four inspectors, one assistant inspector, a staff nurse, a disinfecter (metropolitan area) a caretaker of Colmslie Isolation Hospital, and a rat-gang (metropolitan area) amounting to eleven men. Six rat-deslayers and fumigators were located at outposts.

The staff of the Laboratory of Microbiology and Pathology included the Director, one principal assistant, two assistants, a clerk, and a messenger.

The quarantine staff (administered for the Federal Quarantine Bureau under "*The Quarantine Act, 1908*," of the Commonwealth) comprised thirteen medical quarantine officers, an inspector of shipping and fumigation, and two caretakers of quarantine stations.

Dr. F. W. Woolrabe resigned in April, and Dr. J. Irwin Moore, M.D., F.R.C.S.I., D.P.H., was appointed as Health Officer.

Dr. J. Booth Clarkson, L.R.C.P. & S.E., D.P.H., D.T.M. & H. (Camb.), was appointed as Medical Inspector for North Queensland on 26th October, and subsequently acted as Deputy Commissioner of Public Health during my absence in Torres Straits and Manila.

Mr. Dwyer was appointed as acting secretary of the Nurses' Registration Board.

Senior Inspector Cottle was appointed to the Northern office on 12th February, Inspector Wright on 5th February, and Inspector Wiseman on 11th March. All hold the inspector's certificate of the Royal Sanitary Institute.

Systematic sanitary survey of the principal centres of population has been continued. A list of localities visited and of work done outside the metropolitan area appears in Appendix 8. Two thousand and fifty-six visits of inspection have been made by the headquarters staff in extra-metropolitan areas. Intimation of 264 breaches of the Act or by-laws have been forwarded to the various local authorities concerned. Forty inquiries were ordered under Section 12, and a proportion of the cost, amounting to £164 6s. 8d., was debited to the local authorities concerned.

## XII.—SPECIAL INQUIRIES, REGULATIONS, ETC.

During April and May a tour was made in the Torres Straits islands, for the purpose of investigating local conditions relating to tropical and exotic diseases, and of endeavouring to secure vaccination of the natives. The principal features of this tour are embodied in Appendix 5, and may be summarised as follows:—

Twelve islands, with an estimated population of 1,802 persons, were visited; 1,279 persons were vaccinated, comprising over 70 per cent. of the total estimated native population of those Torres Straits islands which lie within the jurisdiction of Queensland. The sanitary conditions of the inhabited islands were investigated, the native councils were addressed, appropriate methods of remedying sanitary defects were pointed out, and the principal features of local sanitation were discussed with the Government teachers stationed on the principal islands. Inquiry into the question of insect carriers of disease was conducted by Mr. F. Taylor, F.E.S., Entomologist to the Australian Institute of Tropical Medicine. The sanitary details of each inhabited island were investigated by one of the inspectors of this Department.

A valuable and interesting paper by Mr. Taylor, on the Culicidae and Ixodidae (ticks) collected during the tour appears in Appendix 6.

From this it will be noted that the *Stegomyia fasciata* mosquito, carrier of yellow fever, was met with throughout the Straits except on the three islands of Dauan, Saibai, and Boigu, and that it is particularly prevalent in Thursday Island. This mosquito was also found to be plentiful at Cooktown and Somerset. The iron water tanks, which are so commonly used in Queensland, form its chief breeding place.

The diseases prevailing amongst the islanders were enquired into, and the conditions under which the Government teachers live also received attention. Some 13 cases of a disease believed to be gangosa, one of the rarer tropical diseases, were examined and clinically recorded. Photographs of this remarkable ailment appear in the report appended. It has evidently existed for many years in some of the islands, particularly in Murray Island.



Upon completion of the Torres Straits enquiry, opportunity was taken by Ministerial authority to pay a short visit to Manila, Philippine Islands, for the purpose of observing the remarkable work done there by the American sanitarians. Dr. Victor Heiser, Passed Assistant Surgeon of the U.S. Marine Hospital and Public Health Service, Director of Health for the Philippine Islands, kindly placed at my disposal all the available facilities of the Bureau of Health. Amongst other places I was then enabled to visit and inspect the San Lazaro Isolation Hospital, the Bilibid Prison Hospital, the Philippine General Hospital, the various Health Stations in Manila, the San Juan Tuberculosis Hospital, the garbage destructor plant, the steam disinfecting stations at Manila and Mariveles, the Manila abattoirs and markets, the newly constructed sanitary Barrio at Sampaloc, and the Mariveles Quarantine Station. The mosquito-repression organization, directed by Dr. Banks, Entomologist to the Bureau of Science, was also enquired into. Arrangements were made with the Bureau of Science for establishing comparative observations in Queensland on the effect of the actinic rays of the sun in connexion with the question of the colonization of the Tropics by white races.

Regulations dealing with foods and drugs, private hospitals, venereal diseases, and sanitary conveniences and nightsoil disposal, have received Executive approval during the year as has an Order dealing with rats as noxious vermin and specifying measures for their destruction in the metropolitan area of Brisbane.

In September, 1911, the State was represented at the Australasian Medical Congress at Sydney.

### XIII.—MOSQUITO REDUCTION.

The blood-sucking habits of certain species of mosquitoes constitute a very real and definite factor in the public health of any tropical or sub-tropical country, and Queensland is no exception to this rule. Although we are free from yellow fever, despite the presence of its conveying agent, the *Stegomyia fasciata*, as a common domestic mosquito all along our coast, and almost free at the present day from the severer forms of malaria, filariasis and dengue fever are annually responsible in the aggregate for a considerable amount of disablement and sickness. Figures brought forward by Dr. McLean in The Australasian Medical Gazette of May, 1910, show that out of 1,200 persons admitted to the Brisbane General Hospital for all causes from July, 1908, to May, 1910, 130, or 10.8 per cent., had the filarial organisms in their blood, and that a large number of surgical operations were required for conditions of lymph-stasis caused by the parent worms.

Dengue fever is almost certainly conveyed by a common species of domestic mosquito, the *Culex fatigans*, and has in past years caused serious inconvenience to trade and commerce by its widespread outbreaks. In addition to actual disease, the worry, irritation, loss of rest, and personal discomfort for which the various blood-sucking species of domestic mosquito are responsible render their uncontrolled existence incom-

patible with modern conditions of civilized life. Complete extermination of all blood-sucking mosquitoes is obviously impossible; but it is quite feasible, with the expenditure of a moderate amount of money, to reduce very materially the present nuisance and risk in the larger centres, and to attack the admittedly dangerous species in a manner which will form an important safeguard in the future against yellow fever. The provisions of Section 132F of the Health Act now enable the matter to be taken up actively, and furnish the requisite statutory authority which is essential for effective organization and effort.

In anticipation of the work likely to be required under the amending Act, a course of seven lectures and demonstrations on "Disease-bearing Insects and their Destruction" was organized in October and November, 1911, for the instruction of the Departmental staff. These were delivered by Mr. Colledge, M.P.S. (Life History, Identification, and Habits of Domestic Mosquitoes); Dr. T. Harvey Johnston, Lecturer in Biology, University of Queensland (Life History and Habits of Flies, &c.); Dr. A. Graham Butler (Diseases Conveyed by Insects); Dr. J. J. Harris (Methods of Destruction employed against Disease-bearing Insects); and the writer. The course was attended by some 25 of the officers of the Department, a number of inspectors and other officers of Local Authorities, and many private individuals interested in the questions dealt with. The nucleus of a trained staff is thus available in the event of any emergency arising from mosquito-borne disease. Arrangements were also made for an officer to take up a course of special training in mosquito-identification, &c., under the direction of the Government Entomologist (Mr. H. Tryon).

It is well recognized in practice that the first step in any organized effort to deal with lower forms of life consists in identification of the species which it is desired to attack, and accurate delineation of their life-histories under local conditions. A preliminary survey of the general conditions affecting the prevalence of mosquitoes in Brisbane was accordingly carried out in January, February, March, and April by a specially trained officer. Experiments were also put in hand to devise a simple, cheap, and effective mosquito-screen for water-tanks. The results appear in Appendix 7, and may be here briefly summarized, with some of the conclusions to be drawn from them. This preliminary work served the double purpose of securing practical training for an executive officer and of collecting accurate information for subsequent use.

Eight districts in the metropolitan area of Brisbane were taken, the selection being made with a view to securing a wide range of topographical differences. In these eight districts, 1,386 houses were examined in detail, the results being carefully recorded in card form for reference and comparison. All likely breeding places in these areas were searched. Householders were advised by the inspecting officer as to the methods of reducing mosquitoes about their premises, and a pamphlet embodying simple practical information on the subject was distributed freely. Observations were also made on the field use of various larvicides.





BREEDING PLACE OF CULEX FATIGANS.



BREEDING PLACE OF CULEX FATIGANS AND STEGOMYIA FASCIATA.



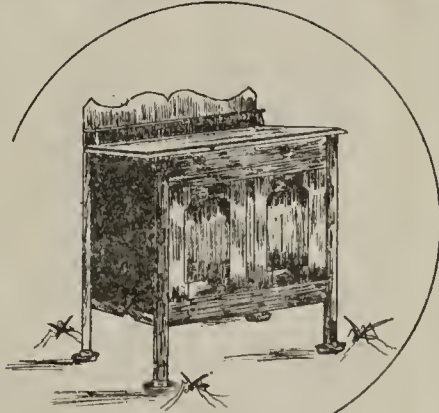
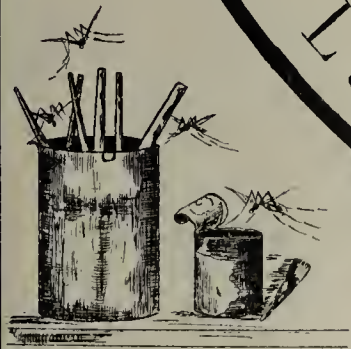
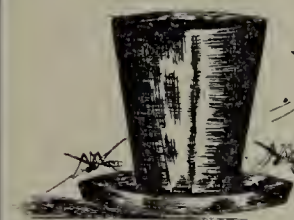
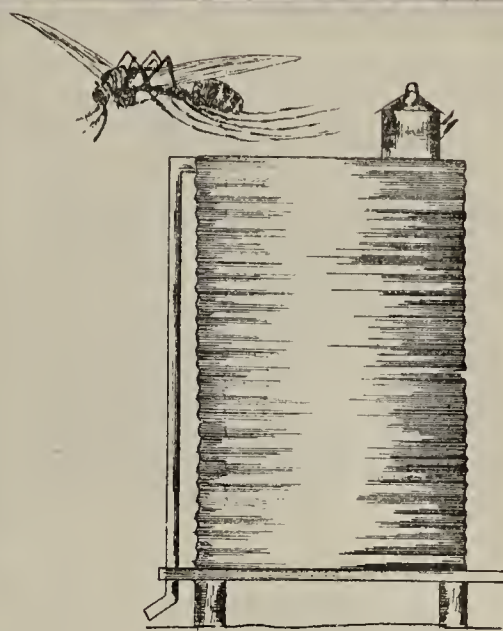
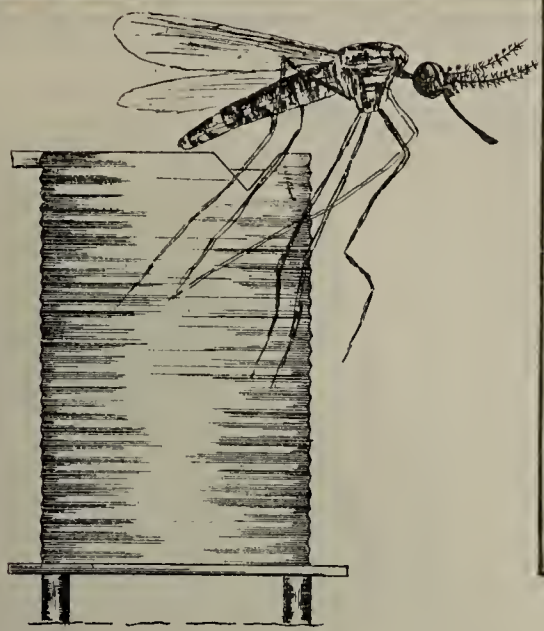




# HOW MOSQUITOES BREED

- TO GET RID OF THEM IN YOUR HOUSE
- (1). SCREEN OR OIL YOUR TANK
  - (2). HAVE NO STAGNANT WATER ABOUT YOUR PREMISES
  - (3). GET YOUR NEIGHBOURS TO DO LIKEWISE

Further information may be obtained from the DEPARTMENT OF PUBLIC HEALTH TREASURY BUILDINGS BRISBANE



*Boobling*







# KILL THOSE FLIES!

Flies carry filth to food and convey disease. They breed in manure and other decaying material.

- (1). Remove manure from near dwellings at least once a week. Allow no decaying matter to accumulate.
- (2). Cover all rubbish bins, empty them at least once weekly, and sprinkle them inside with disinfectant after emptying.
- (3). Keep flies away from the closet pan by sprinkling the contents daily with kerosene and soapsuds mixture, or by covering contents with earth or sawdust.  
Do not put slops in the pan.
- (4). Use fly papers, or, a teaspoon-ful of formalin in a pint of water, about the house as a poison for flies.
- (5). Cover milk and food to exclude flies.

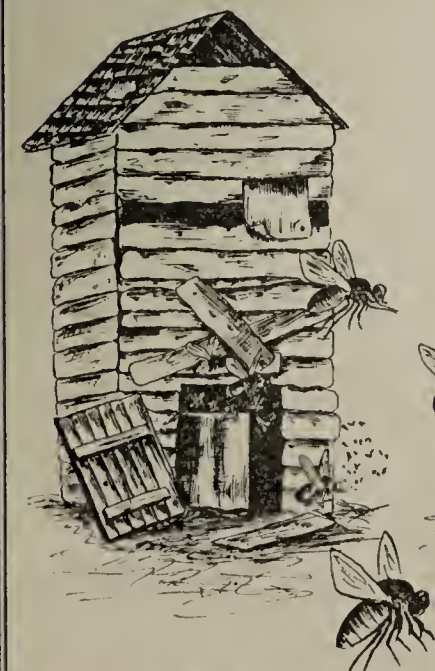
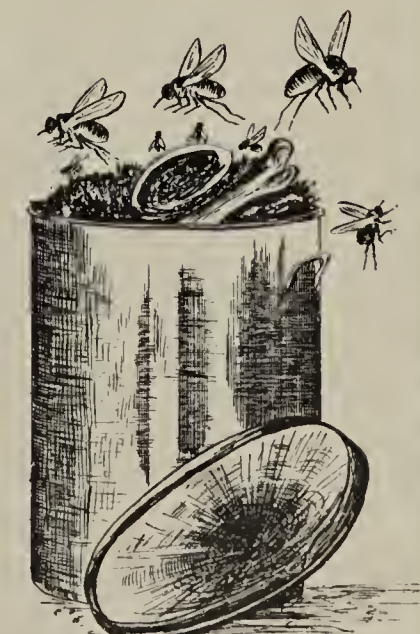
## HOW FLIES BREED



THESE STAGES ARE PASSED IN MANURE OR OTHER ROTTING MATERIAL

Flies are especially attracted by human excrement

THE FLY-ROAD FROM CLOSET PAN TO DINNER TABLE IS VERY SHORT









The 1,386 houses examined had amongst them 1,832 tanks, of which 679 (37 per cent.) were acting as breeding places for the *Stegomyia fasciata* ("tiger," or yellow-fever mosquito). Only three tanks contained *Culex fatigans* (the "filaria" mosquito) larvae, and one contained larvae of *Culex tigripes*. It is thus abundantly clear that about Brisbane the chief breeding place of the dangerous and annoying *Stegomyia fasciata* mosquito is the ordinary domestic rain water tank. It also breeds freely in old tins, bottles, &c., containing rain water.

Of the 1,832 tanks examined, only six were screened, and none of these contained mosquito larvae. 139 were stated to be treated with kerosene, of which 36 (26 per cent.) harboured larvae. Enquiry showed that in the great majority of cases the oil was inadequately or irregularly used. In all cases where one table-spoonful or more of kerosene was applied to the tank, each week, no larvae were found. Of 1,687 untreated tanks, therefore, 38.5 per cent. contained larvae, whilst of 145 tanks in which some attempt at protection was made, however defective it may have been in practice, only 25 per cent. contained larvae.

187 street gully traps were examined, and 141 (75 per cent.) were found to be acting as breeding places, principally for the *Culex fatigans*. The percentage would probably have been higher but for the summer rains, which washed the larvae into the sewers.

The principal associated species in street gullies was *Culex tigripes*, which is a cannibal in its larval stage, and devours the larvae of *Culex fatigans*. It is not an effective factor, however, in keeping down the latter, and is itself a blood-sucker in the adult stage. Street gullies are thus an important breeding place for *Culex fatigans*, which carries filaria, and is probably responsible for the conveyance of dengue fever. Puddles and other small areas of stagnant water about houses are also active breeding places for this species.

A remarkable invasion by *Culex vigilax* (the black bush mosquito) was noted during the warm weather in several districts, and this mosquito, although principally infesting shrubberies and gardens, and regarded formerly as an almost purely feral species, showed a distinct tendency to come into houses. It prefers to breed in salt or brackish water, such as the salt swamps left after king tides on low-lying land, and can apparently travel a mile or more on prevailing winds. It is a vicious blood-sucker. Several extensive breeding places were located for future action, and experimentally dealt with by means of larvicidal application.

Breeding places of the "Scotch Grey" (*Mucidus alternans*), and of the *Culicella annulirostris*, were also located. In a few cases larvae of the anopheline *Nyssorhynchus annulipes* were found in natural collections of fresh water. In two cases the larvae of this anopheline were found in street gully traps with those of *Culex fatigans*.

The principal conclusions drawn from this enquiry may be thus summarized:—

(1) The principal species of mosquitoes requiring action in Brisbane are the *Stegomyia*

*calopus* ("tiger," or yellow-fever mosquito); the *Culex fatigans* (conveyer of filaria, and probably of dengue fever); and to a lesser extent the *Culex vigilax* (black bush mosquito).

(2) The *Stegomyia calopus* is a tank-breeder, and can only be dealt with by rendering tanks and similar artificial collections of clean water unfit or inaccessible for breeding. The regular application of kerosene or other larvicide is very liable to be neglected by occupiers, or carelessly done, and wire screening of all tanks is necessary for the reduction of this species.

(3) The *Culex fatigans* breeds in natural or artificial collections of (dirty) water, and under city conditions largely in street gully traps. It can be dealt with by searching out and destroying its breeding places, and by systematically applying suitable larvicides in order to kill the eggs, larvae, and pupae. It breeds on occasion in very foul liquids—for example, liquid manure.

(4) Ninety per cent. at least of the mosquitoes infesting houses are bred on the premises or on the premises of near neighbours. The two species of "house mosquito" do not travel far, and seldom breed away from human habitation.

(5) Even such small domestic collections of water as safe-leg dishes, fowl drinking troughs, and flower vases are effective breeding places for domestic mosquitoes if neglected.

(6) The *Culex vigilax* breeds principally in salt or brackish water in swamps or marshes, and may travel a mile or more with winds. It is not a domestic mosquito under ordinary conditions, but infests gardens and shrubbery.

(7) Great reduction of the principal species which infest houses is possible in the larger centres of population at relatively small expense. This work requires, however, to be scientifically planned, and carried out under expert direction.

The necessary statutory powers having been provided by "*The Health Act Amendment Act of 1911*," and the nucleus of a trained executive staff being at last available, operations for mosquito reduction in and about Brisbane are now in process of organization. The results obtained will determine the lines on which similar measures can be organized and applied in other centres of population.

An interesting example of the manner in which a country township may be freed from the mosquito nuisance by a little local effort occurred during the summer. During November, the Local Progress League at Kingston, a small township some 17 miles south of Brisbane, appealed for assistance against a veritable invasion of mosquitoes which, despite the oiling of tanks and other domestic measures, was making life almost unbearable, and offered to pay expenses incurred. An inspector was sent down, and made a "mosquito survey." The breeding place of the mosquitoes was found to be in a few small lagoons which had been used for the discharge of butter-factory drainage. Numerous other lagoons in the vicinity were free of mosquitoes, although at first glance they appeared to be typical breeding places. They were, however, tenanted by large numbers of small fish (*Rhombatraceus fitzroyensis*, or crimson-spotted



sunfish, and *Hypreoleotris compressus*, or carp gudgeon), which destroyed the larvæ and eggs. These fish were not found in lagoons to which the factory drainage was admitted. Phinotas oil was sprayed over the breeding pools, and a few days afterwards the mosquito nuisance disappeared. A shortage in supplies of Phinotas oil resulted in intermittent return of the mosquitoes, but on 22nd February the secretary of the Progress League wrote as follows:—"Usually Kingston has been considered a hotbed for mosquitoes, but I am pleased to say we have practically freed the locality from the pest. . . . We intend to continue treating pools infested with mosquito larvae, right on, and until such time as we have completely rid the locality of the presence of mosquitoes."

A poster for public information in connexion with mosquitoes, and another relating to flies, have been designed for use during the coming year, and are reproduced herewith.

### CONCLUSION.

The policy of the Department has been directed towards laying a sound foundation on which there may be erected an enduring sanitary superstructure. Modern public health work is developing rapidly along assured and well-tried lines, but knowledge of these developments has not yet reached the general public. The old empirical "clean up" policy no longer holds its former place as the first and vital step towards sanitary safety, but it will apparently be a long time before it becomes generally recognized that the function of a Department of Public Health or a Local Authority is not that of abolishing stinks, clearing choked drains, removing dead animals, and cleaning up back-yards. These measures are highly desirable, if only as conditions antecedent to ordinary civilized comfort, but they do not require skilled sanitarians for

their performance. The real road to safety lies in such technical undertakings as the analysis of foods, the suppression of adulteration, and the protection of food manufacturing processes from risk of introducing disease; in systematic warfare against tuberculosis and the social and structural conditions which favour its spread; in locating and controlling the more dangerous type of disease "carrier"; in securing the protection of communities from the specific disease poisons liable to be distributed by infected excreta; in eradicating vermin which are liable to convey disease to man; in providing means for accurate investigation and prevention of disease; and in educating the people by every available method, to replace ignorance, apathy, or misdirected effort by an intelligent view of the actual factors concerned in disease and disease prevention, and the deliberate intention to deal effectively with them.

Disease cannot be explained away, or abolished by Act of Parliament; it has no respect for boundaries, and it does not utter any formal declaration of war. Its successful prevention and control become more and more of a technical process, as its relative features are successively laid bare by patient laboratory workers. The protective value of any Health Act depends upon the adequacy and efficiency of the means provided for operating it, and the knowledge with which these are employed. The requisite legal powers are now available in Queensland for coping successfully with the problem of communicable disease. Success or failure will depend upon the executive agencies provided, and upon the response of the people to State and local effort.

I have, &c.,

J. S. C. ELKINGTON,  
Commissioner of Public Health.



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## APPENDICES.

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### APPENDIX 1.

#### REPORT OF MEDICAL INSPECTOR, NORTH QUEENSLAND.

Department of Public Health, Queensland.

Northern Sub-office, Townsville.

SIR,—I have the honour to submit the following report for your information on the work of the Northern Office for the year ending 30th June:—

Having been gazetted Medical Inspector for North Queensland on the 26th October, 1911, I was attached to the Public Health Department, Brisbane, for about ten weeks. I left Brisbane with Inspectors Dudley and Burton, arriving in Townsville on 17th January, and opened the Northern Office on the 18th idem.

Official work was commenced at once, and the many requests for inspections from various parts of the North showed the necessity for the inauguration of such an office. Its value was proved furthermore by the fact that, owing to the strike stopping steamer traffic, no inspectors or other officials could have been sent to the North from Brisbane had urgent need arisen for their services in connection with serious outbreaks of infectious diseases or sanitary conditions requiring prompt attention.

The following places were visited by request by the staff inspectors:—Port Douglas, The Mossman, Cairns, Innisfail, Halifax, Wolfram Camp (where an outbreak of enteric occurred), Ingham, Charters Towers, Queenton, Ayr, Bowen, Proserpine, Mackay and vicinity. All these places were fully reported on and advice given as to the proper methods of remedying sanitary defects.

Later, inspections were made of Cloncurry and Malbon in view of an outbreak of enteric fever having occurred in the Malbon railway camp.

A large number of interviews was held with officials and the general public in regard to rat and mosquito destruction and various sanitary matters, on which subjects a large amount of general instruction was given.

While on their inspecting tours the inspectors were ordered to assist the Australian Tropical Institute of Medicine by sending specimens of mosquitoes, &c., and collecting any required information.

In due course Inspectors Cottle, Wiseman, and Wright relieved Inspectors Dudley, Cato, and

Burton, of the Head Office staff, the latter officers having been temporarily attached to the Northern office.

Active attention was given to the matter of food inspection, which resulted in considerable quantities of vegetables, fruit, and fish being condemned by mutual consent, and proceedings were instituted for the destruction of 800 tins of "Defender" Salmon, which were seized as being unfit for human consumption. The result led to the condemnation of the salmon, which was accordingly destroyed on an Order from the Minister in accordance with the Health Act Amendment Act provisions.

During the strike, owing to the electors differing, there was no mayor for nearly three weeks, and Clause 172 B of "*The Health Act Amendment Act of 1911*" was found valuable as enabling the town clerk to act as mayor for health emergencies.

During the absence of the Quarantine Officer and Medical Officer of Health advice was given to his locum tenens, both in regard to quarantine matters and municipal sanitation in Townsville.

The fumigator and rat-catcher was found to be performing his work unsatisfactorily, and was replaced by J. P. Hickey, who was transferred from the Head Office.

The Government property belonging to this Department at Mackay, Bowen, Townsville, and Cairns was carefully checked with the existing inventories, and articles found to be unserviceable were condemned and where necessary replaced.

I left for Brisbane on the 8th April to act as Deputy Commissioner of Public Health, and since then Townsville, Thuringowa, and Magnetic Island have been thoroughly inspected, both from a general sanitary point of view and also in regard to rat and mosquito infestation. The result of these inspections shows that many sanitary improvements were much needed, especially in regard to water supply, garbage service, sanitary depôt, and general sanitation, and notices were sent to the various local authorities with a view to steps being taken to remedy defects.

The State schools at Mossman and Brandon, where outbreaks of diphtheria had occurred, were



disinfected at the request of the Department of Public Instruction. At the same time opportunity was taken to investigate the sanitary conditions of these townships, also the railway camp near the Burdekin River. The latter particularly was reported to be in a very unsatisfactory condition, and steps have been taken to improve matters.

Some clerical assistance will shortly be necessary, as it frequently happens that the staff have to devote their time to the correspondence when they might be more usefully employed. As my duties will be chiefly of a travelling and inspecting nature, it will be quite possible that I and the three inspectors may be all absent at the same time. It is very advisable to have available a clerical officer acquainted with the office routine, who would be able to receive interviews in my absence, and could give satisfactory replies to the very numerous inquiries on official matters.

When Dr. Eleanor Bourne, Medical Inspector of Schools, and the School Nurse arrived at Townsville my office was placed at their disposal.

In conclusion, I desire to express my gratitude to the Townsville Press for the valuable assistance rendered me by placing their columns at my disposal on matters affecting public health generally, and it is to a great measure due to their co-operation that the Northern Sub-office has met with the appreciation of those for whose interests the office was established.

I have, &c.,

J. BOOTH-CLARKSON,

Medical Inspector for North Queensland.

The Commissioner of Public Health, Brisbane.

## APPENDIX 2.

### REPORT OF HEALTH OFFICER.

Department of Public Health, Queensland,  
Brisbane, 5th August, 1912.

SIR,—I have the honour to submit my report for the quarter ending 30th June, 1912:—

Having joined this Department in the middle of March, my time has been partly taken up with getting an insight to correspondence and office routine.

#### METROPOLITAN AREA.

I found it necessary to visit the Children's Hospital regarding an outbreak of diphtheria, which was taxing the accommodation of the institution so much that the Resident Surgeon had to discharge some of the little patients, who, although cured of the disease, were still carrying the Klebs-Loeffler bacillus in their throats.

This system, although admitted by the Resident Surgeon to be dangerous, had to be adopted to make room for more serious cases seeking admission. In these cases of "carriers" I requested the Resident Surgeon to forward the names and addresses to the Health Department, on receipt of which the Department's staff nurse visited them, to see that proper isolation was being carried out and that no children were allowed to attend school from the infected houses. In the month of June I visited the Kangaroo Point schools in connection with an outbreak of diphtheria. After interviewing the head teachers I considered it necessary to advise closure of the schools for a couple of days to have them thoroughly disinfected, which was carried out by the Health Department's disinfecting staff. Although school closure is seldom required, the particular conditions in the present instance rendered the procedure advisable.

The rat gang are doing good work in the city. The total catch in the metropolitan area for the year of rats and mice was 36,405.

#### PLACES VISITED.

Ipswich, on two occasions; once, accompanied by Inspector Dudley, to report on a new site for the Infectious Diseases Hospital, near Sandy Gallop; and once by myself, to look at the One-mile site for the same purpose.

Toowoomba, on two occasions; accompanied by Inspector Dudley the first time and Inspector Beaver the second time. Both visits were in connection with a sanitary site, the Toowoomba Council being anxious to revert to nightsoil burying instead of continuing their effective system of incineration. However, wiser counsels prevailed, and incineration has received a new lease of life.

#### LAZARET, PEEL ISLAND.

I was appointed Medical Officer in the month of March, thus relieving Dr. L. E. Row of the charge of the Lazaret. The following particulars, from the 1st July, 1911, to the 28th March, 1912, have been supplied by Dr. Row:—

Remaining on 30th June, 1911	...	...	69
Admitted between 30th June, 1911, and 28th March, 1912	...	...	3
			72
Discharged	...	...	3
Died	...	...	10—13
Total	...	...	59

The admissions represented one white male and two coloured males; the discharged included three coloured males, released on surveillance as apparently cured.

The deaths were one white female, one coloured female, and eight coloured males.

From the 28th March and up to the 30th June, 1912, there was admitted one white male from





GANGOSA—MURRAY ISLAND.



GANGOSA—MURRAY ISLAND.









GANGOSA—BOIGU ISLAND.



GANGOSA—MURRAY ISLAND.









GANGOSA—SAIBAI ISLAND.



GANGOSA—SAIBAI ISLAND.







Mount Morgan, and during the same period there died two white males and one coloured male, leaving a total of 57 remaining on the 30th June, 1912, made up as follows:—

White females	...	...	5
White males	...	...	18—23
Coloured females	...	...	6
Coloured males	...	...	28—34
			—
			57

The coloured inmates included aboriginals (females 5, males 8), kanakas (female 1, males 16), Chinese 3, Cingalese 1. The varieties of disease amongst the patients were:—

1. Nodular Leprosy.
2. Anaesthetic Leprosy.
3. Tuberculo-anaesthetic Leprosy.

The principal treatment adopted has been the recognised Chaulmoogra Oil, and its purified form Antileprol.

Ten patients are undergoing the hypodermic treatment with Nastin. Although in other countries Nastin has not proved the success anticipated, I am

continuing it, hoping to definitely settle the question of its relative value under Queensland conditions.

The Director of the Laboratory of Microbiology and Pathology has undertaken experiments with a view of cultivating the bacillus of Leprosy, from local cases, and of thus attempting the manufacture of a specific vaccine.

#### QUARANTINE.

Three persons under quarantine surveillance came under my notice, one from s.s. "Afric," supposed to be phthisis, and allowed three months in Queensland, and two from s.s. "Yawata Maru," on which a case of smallpox occurred.

#### VACCINATION.

Three inspectors going to the Northern Office, Townsville, were vaccinated, also two members of one of their families. An official from the Customs Department, Brisbane, was also vaccinated.

I have, &c.,

J. IRWIN MOORE, Health Officer.

The Commissioner of Public Health, Brisbane.

### APPENDIX 3.

#### REPORT OF THE DIRECTOR, LABORATORY OF MICRO-BIOLOGY AND PATHOLOGY.

Laboratory of Micro-Biology and Pathology,  
Brisbane, 16th July, 1912.

SIR,—I have the honour to submit the following report of the work done at this Laboratory in connection with the Department of Public Health, during the year ending 30th June, 1912:—

**PLAGUE.**—No work was done during the year in connection with human plague, but a large number of rats and mice were examined, also nearly 2,000 rat spleen smears from the Northern coastal towns. In no case was the plague bacillus found.

**TUBERCULOSIS.**—As with suspected typhoid blood examinations for Widal's test, and with suspected diphtheria throat-swabs, a slight increase in the amount of work done is noticeable, the increase probably being because from the 1st January of this year the examinations were done free of charge.

**TYPHOID FEVER.**—A large number of bloods were examined for Widal's reaction. An increase in the number of waters examined for the presence of the *B. Typhosus* is shown, but in none of them was the bacillus found.

**DIPHTHERIA.**—An increased amount of work has been done in throat and nose swab examination. This increase was largely due to the swabs taken in the schools by Dr. Bourne. The increase in the number of swabs received from medical practitioners was small and disappointing.

**TROPICAL DISEASES.**—The work done in so called tropical diseases, as malaria, filariasis, and ankylostomiasis, has more than doubled, but the total number of specimens examined was so small that the increase, though apparently large, is really small.

The work in the examination of leprosy smears has largely increased since the Department assumed control of the Peel Island Lazaret, the increase being due to re-examination of old cases.

**PATHOLOGICAL TISSUES.**—An increased number of tissues have been examined and reported on. During the year occasional complaints have been made because of the time taken before the report is received. If these examinations were at all hurried, the histological structure would in many cases become so altered that a diagnosis would become impossible, or at least more liable to error. A mistaken diagnosis would not be very creditable to the Laboratory. Delay in the report is also often due to the amount of reading which is rendered necessary by the meagreness or absence of the history.

**AUTOGENOUS VACCINES.**—Autogenous vaccines to the number of 37 were made, showing an increase of over 50 per cent. The results have not been ascertained, because in only ten instances was the printed form, sent to the practitioner with or shortly after the vaccine, returned with the results of treatment recorded.

**DISINFECTANTS.**—Twenty disinfectants were examined for the Rideal-Walker coefficient. As in most of these only one sample of each was examined, no evidence of uniformity of germicidal effect was forthcoming.

**WATER EXAMINATIONS.**—Eighty-one samples of water were examined during the year, most of them being taken by the Metropolitan Water and Sewerage Board from the sources of the water supply. As the Water Board instal their filters during next year the number of these examinations should largely increase if the Water Board intend to check their filters in a proper manner.



For the year the total time-consuming work has increased by about 50 per cent., and I anticipate for the coming year a greater increase.

In conclusion, I think that a good deal of useful work might be done in the future in connection with the preparation of anti-typhoid vaccine. Our present knowledge of typhoid fever seems to show that many epidemics in armies, railway and mining camps, and public institutions owe their beginning to the bacillus carrier. Against the carrier most of the usual preventive measures appear to partly fail, so some additional method of fighting the disease is required.

Since the first attempts by Wright, in 1896 and 1897, to protect against typhoid fever by means of vaccines, much work has been done to show that in vaccination we have a powerful weapon in the war against the disease. During the Boer War, Wright claims to have reduced the incidence by one half and the mortality even more so. He supplies the following figures:—

No. of Men.	No. of Cases of Typhoid.	Deaths.
Inoculated, 19,069	... 226 (1.18%)	... 39 (17%)
Not inoculated, 150,231	3,739 (2.48%)	... 25%

After the Boer War vaccination was not carried out in the British Army for some years, when Colonel Leishman improved the method of vaccine preparation and inoculated many thousands of soldiers.

He tabulates the results up to 1908, and concludes that for every one case of typhoid fever in the inoculated there are ten in those not inoculated, and that the deaths among those not protected are ten times as numerous as among those protected.

The death rate among those not protected was higher than the incidence among those protected.

The latest figures available from the British service are those of Colonel R. H. Firth, R.A.M.C., covering the Army in India during the years 1906 to 1910, inclusive.

He gives the rates of typhoid and of deaths therefrom, and of men inoculated per thousand for these years as follows:—

In 1906 the typhoid rate was 15.6 and the death rate 3.19 among a military population, 66 per thousand of whom had been inoculated.

In 1907 the typhoid rate was 13.1 and the death rate 2.77, the inoculated population being 143 per thousand.

In 1908 the typhoid rate was 14.5, death rate 2.76, inoculated population 225 per thousand.

In 1909 the typhoid rate was 8.9, death rate 1.58, inoculated population 613 per thousand.

In 1910 the typhoid rate had fallen to 4.6, the death rate to 0.63, while the protected population had risen to 823 per thousand.

Here the use of inoculation must be given the credit for a reduction in five years of the typhoid rates from about 15 to less than 5 per thousand, and the death rates from over 3 per thousand to 0.63 per thousand.

Taking the year 1910 there occurred in a strength of about 70,000 men, 306 cases of typhoid, that is 155 in about 60,000 inoculated, and 151 in about 10,000 who were not inoculated.

This gives a rate approximately six times as great for those not inoculated. Of those who contracted typhoid, 11.2 per cent. of those inoculated died, while the death rate for those not inoculated was 16.1 per cent.

Results similar to these, though not so brilliant, were obtained in the German Army in South-west Africa during their campaign against the Hereros (1904-1907).

The results are less brilliant because at that time the methods of preparation of the vaccine were inferior to present-day methods.

Of 16,496 men who participated in the campaign, 7,287 took the inoculation, which was voluntary. Among these men there occurred 1,277 cases of typhoid, 5.09 per cent. for those inoculated, and 9.85 per cent. for those not inoculated.

Still more striking is the evidence shown by the difference in the death rates, cases among the inoculated giving a death rate of 6.47 per cent., while for those not inoculated the death rate was 12.8 per cent.

When it is considered that these figures show nearly 1,300 cases of typhoid, all with the same surroundings, the value of the prophylactic inoculation in reducing the severity of the disease is beyond question.

Nowhere, however, do we get such convincing evidence for the practice of typhoid immunisation as from the records of the United States Army.

Up to the present over 60,000 men have completed the vaccination, and among this entire number, over a period of three years, but twelve cases of typhoid have developed, and no death has occurred.

The record of the Manoeuvre Division in camp at San Antonio, Texas, last year has been most instructive.

An army division having an average strength of 12,800 men, all inoculated, occupied the same camp for four months, from March to July, and in this command but one case of typhoid developed, in a hospital corps man who had not completed the inoculation.

The figures of this division when compared with those of another division in camp in Florida four years before, under much the same conditions, are very striking.

	No. of Troops.	Typhoid.	Deaths.
Texas	... 12,801	... 1	... 0
Florida	... 10,758	... 2,693	... 248

The preparation of the vaccine as carried out by Major F. F. Russell in the Laboratory of the Surgeon General's Office in Washington, can be done possibly equally as well in this Laboratory; in fact, I think that by applying the results of research throughout the world during the last twelve months, the American Army method can be improved upon.

This question of improvement can be readily answered by experiments on Laboratory animals.

A complete inoculation necessitates three doses at intervals of ten days. The first dose gives rise to a reaction, varying in severity, but in the majority



of cases it is slight. After the second dose the reaction is not so marked, and after the third dose it is practically absent.

Locally, there is an area of hyperaemia round the puncture, and more deeply there is a somewhat tender, sharply circumscribed area of induration.

Movement of the muscles in this area is painful, and there is stiffness. Exceptionally there is some swelling and tenderness of the axillary glands, but no case of suppuration has ever been reported.

Sloughing round the site of infection never occurs. An urticaria is an uncommon result. Herpes has been reported a few times.

Some constitutional disturbance is usual, though frequently absent. This consists of feverish sensations and malaise in the lighter cases.

The more severe reactions show a fever in the neighbourhood of 101 degrees F., chills, slight nausea, profuse perspirations, and some nervous disturbance.

Hysterical symptoms have been reported.

The onset of the reaction is usually within six hours, it is at its height in twelve hours, and has subsided in twenty-four hours, leaving only a little stiffness of the arm.

Children, though complaining uniformly of the local pain, have usually but little general reaction.

The reaction in the most severe cases cannot be compared with vaccinia, and is very much less severe than a vaccination against plague.

The protective power of anti-typhoid vaccination persists for at least two years, but how far beyond this period it might remain time has yet to prove.

In addition to prophylaxis this vaccine could be used in the treatment of typhoid fever, and some encouraging results have been reported, but they are not yet sufficiently numerous to base definite conclusions upon.

A tabular summary of the specimens above referred to will be found appended.

I have, &c.,  
JOHN J. HARRIS, Director.

The Commissioner of Public Health, Brisbane.

Table giving particulars of specimens examined at Laboratory of Micro-biology, during year ending 30th June, 1912:—

Disease Suspected.	Nature of Specimen.	Number.	Positive.
Plague ... ..	Rats ... ..	25,309	...
	Mice ... ..	1,991	...
	Mackay smears ... ..	1,495	...
	Townsville smears ... ..	453	...
	Guinea pigs ... ..	3	...
Tuberculosis ... ..	Sputum ... ..	348	122
	Pleural effusion ... ..	1	...
	Urine ... ..	1	...
	Pus from sinus ... ..	1	...
	Cerebro-spinal fluid ... ..	1	...
	Perspiration ... ..	1	...
	Cow's milk ... ..	1	...
	Blood ... ..	256	92
	Urine ... ..	1	...
	Fæces ... ..	1	...
Typhoid ... ..	Water ... ..	31	...
	Blood ... ..	5	...
Malaria ... ..	Urine ... ..	1	...
Filaria ... ..	Blood ... ..	7	1
	Dilated lymph vessels from groin ... ..	1	...
Diphtheria ... ..	Throat-swabs ... ..	145	17
Leprosy ... ..	Water ... ..	3	...
	Serum ... ..	39	15
Gonorrhœa ... ..	Blood ... ..	1	...
	Pus ... ..	29	7
Ankylostomiasis... ..	Spermatic fluid ... ..	1	...
	Fæces ... ..	7	1
Malignant Pustule ... ..	Pus ... ..	1	...
Pernicious-anæmia ... ..	Blood-films ... ..	2	...
Ringworm ... ..	Hair, scales, &c. ... ..	1	1
Syphilis ... ..	Smear from groin ... ..	3	1
Meningitis ... ..	Cerebro-spinal fluid ... ..	2	...
Tetanus ... ..	Splinters and pus ... ..	1	...
Erysipelas ... ..	Pus from abscess ... ..	1	...
Malignancy ... ..	Tissues ... ..	168	...
	Sputum ... ..	1	...
	Fluid from chest cavity ... ..	1	...
	Quilt, trousers, &c., for blood stains ... ..	1	...
	Piece of rug and lump of earth, for blood stains ... ..	1	...
Autogenous vaccines	Pus ... ..	17	...
	Culture ... ..	6	...
	Smear ... ..	1	...
	Nose and throat swabs ... ..	1	...
	Blood ... ..	2	...
	Urine ... ..	3	...
	Sputum ... ..	3	...
	Eye discharge ... ..	1	...
	Uterine secretion ... ..	2	...
	Discharge from uterus ... ..	1	...
Miscellaneous ... ..	Water, gen. exam. ... ..	81	...
	Pus, gen. exam. ... ..	2	...
	Urine, gen. exam. ... ..	9	...
	Urine, for casts only ... ..	8	...
	Urine, chemical exam. ... ..	2	...
	Sputum, gen. exam. ... ..	3	...
	Blood for differential count ... ..	1	...
	Disinfectants ... ..	20	...
	Ice cream, gen. exam. ... ..	1	...
	Sundry examinations ... ..	29	...
Total ... ..		30,514	

JOHN J. HARRIS, Director.

#### APPENDIX 4.

#### REPORT OF THE GOVERNMENT ANALYST,

Government Chemical Laboratory,  
Brisbane, 25th July, 1912.

SIR,—I have the honour, in accordance with section 31 of "The Health Act of 1900," to submit the following report of work done in the Government Chemical Laboratory for the Health Department during the year 1911-1912.

The number of samples received during the year was 599, involving 3,937 determinations. This was an increase of 137 samples compared with the previous year. The principal increases were in milk samples and water samples.



The following is a summary of the work done during the year:—

Sample.	Passed.	Failed.	Total.
Barley ... ..	1	...	1
Beverages and cordials ... ..	24	1	25
Butter ... ..	18	...	18
Coffee ... ..	3	1	4
Cream of tartar—			
Test on importation ... ..	90	1	91
Legal ... ..	12	1	13
Cream ... ..	...	...	2
Custard and other powders ... ..	6	...	6
Embrocation ... ..	1	...	1
Fish (tinned)... ..	2	19	21
Flour ... ..	1	...	1
Ice Cream ... ..	1	...	1
Jams and jellies ... ..	2	...	2
Lead-poisoning cases ... ..	...	...	1
Limejuice ... ..	...	3	3
Margarine ... ..	1	...	1
Milk (condensed) ... ..	...	...	8
Milk (dried) ... ..	2	...	2
Milk (fresh) ... ..	203	69	272
Meat (manufactured) ... ..	...	6	6
Meat (potted) ... ..	2	...	2
Miscellaneous ... ..	12	...	12
Peas ... ..	1	...	1
Pepper ... ..	2	2	4
Preservative ... ..	2	...	2
Rat Poison ... ..	3	...	3
Rice ... ..	1	2	3
Rum ... ..	...	2	2
Salt ... ..	1	...	1
Sauce ... ..	1	...	1
Tea ... ..	2	...	2
Vinegar ... ..	...	2	2
Water ... ..	...	...	11
Water (Water and Sewer. Board) ... ..	...	...	74
Total ... ..	...	109	599

Of the 272 samples of milk examined during the year 265 were legal samples. Of this number 69, equivalent to 26 per cent. of the total, failed to pass the legal standard. The average percentage of added water in these samples was 12 per cent. The amount of added water is determined by the freezing point, which long experience shows to give the result with far greater accuracy than any other method.

An illustration of the accuracy of the method was obtained during the year. A sample was received which gave the following results on analysis:—

Total solids ...	12.2 per cent.
Solids not fat ...	8.3 „
Fat ... ..	3.9 „
Ash ... ..	0.7 „
Nitrogen ... ..	0.51 „

Judged by the old methods the milk would probably have been passed as just a shade under standard. The freezing point, however, showed added water to the extent of 8 per cent. A short time afterwards, in a prosecution of certain employees by a dairy company for theft, an employee admitted having sold watered milk to the vendor of this sample. The chemist for the company had analysed the milk before it was watered by the employee, and he kindly supplied me with the analysis. A comparison of results showed that 7.5 per cent. of water had been added.

In another similar case, where the sample had been reported, relying on the freezing point, as containing 13 per cent. of added water, subsequent information from an analysis of the milk by the vendor's analyst before the sample had been watered showed the addition of 13.5 per cent. of added water.

In last year's report it was pointed out that there was a slight improvement in the quality of the milk supply. The following table shows, however, that there has been a set back this year, the larger

number of samples taken giving also a better idea of the general state of the trade:—

Year.	Milk Samples.		Per Cent. Failed.	Average per cent. of Added Water.
	Total.	Failed.		
1907-1908 ...	66	37	56	8.7
1908-1909 ...	158	64	40	10.0
1909-1910 ...	78	19	24	8.3
1910-1911 ...	122	28	23	7.9
1911-1912 ...	265	69	26	+12.0

\* Calculated on 5.5 per cent. solids not fat.  
+ Determined by freezing point.

MILK PROSECUTIONS FOR 1911-1912.

Number.	Fines.	Costs.	Total.
	£ s. d.	£ s. d.	£ s. d.
45 (for adulteration) ...	345 7 6	78 12 0	423 19 6
1 (for refusal to sell) ...	2 0 0	2 5 6	4 5 6
Total 46.	£347 7 6	£80 17 6	£428 5 0

The proportion of added water in the samples varied from 2 to 59 per cent. Only four samples were deficient in fat, the freezing point of these showing that water had not been added. Taking the annual consumption of milk in Brisbane and suburbs as approximately 2,000,000 gallons, and the proportion of adulterated samples found as fairly representative, then 62,400 gallons of water of very doubtful quality were sold as milk. With 5d. per quart as the average price, this represents over £5,200 paid by the public for water. As slightly less than one-twelfth of this was recovered in fines and costs, there is still a very wide margin of profit to be obtained by those dishonest vendors who sell watered milk.

Of 52 samples of milk taken at the town railway stations as it arrived from the country 6 contained added water, the average amount being 6 per cent. The fat in 26 of the samples varied from 3.5 to 4.0 per cent., the remaining 26 containing from 4.0 to 6.2 per cent. It would appear from the above results that most of the adulteration is done after the milk leaves the station.

The average composition of the samples of genuine milk tested during the year was—

Total solids ...	12.6 per cent.
Fat ... ..	3.9 „
Solids not fat ...	8.7 „

It is a pity that some standard for cleanliness and freedom from bacterial contamination cannot be enforced. It is quite true that much of the dirt in the milk supply goes in with the dirty water used in the adulteration, but there is a very much greater loss of infant life through the poisoning by dirty legally "pure" milk than is caused by starvation through feeding with adulterated milk. The infant mortality would be much lowered if a supply of clean milk could be assured all the year round.

Two samples of dried milk were analysed, with the following results:—

—	Skimmed.	Full Cream.
	Per cent.	Per cent.
Moisture... ..	2.9	1.8
Butter Fat ... ..	1.7	31.6
Milk Sugar ... ..	51.4	35.25
Proteids ... ..	36.0	25.9
Ash ... ..	8.0	5.45
	100.0	100.0



The fat content in the samples of condensed milk received varied from 9.0 to 11.3 per cent., the mean being 10.5 per cent. They were all fit for human consumption.

All the samples of butter examined were up to the standard.

One sample of margarine conformed to the new standard.

The one sample of barley examined was genuine.

One sample of tinned peas received was free from copper compounds, and was fit for human consumption.

Two samples of rice were coated with glucose and French chalk, and one sample was genuine. Under the new regulations the addition of any foreign substance to rice, including, therefore, the "polishing" with glucose and French chalk, is prohibited.

Of twenty-five samples of beverages and cordials examined twenty-four were passed as being fit for human consumption. A sample of vanilla cordial contained saccharin.

The samples of limejuice received were not genuine, but consisted of tartaric acid and water, with preservative and artificial colouring matter. Both samples of rum were artificial.

Three samples of coffee were genuine. One sample, packed in Queensland, was a mixture of equal parts of coffee and chicory. Because the presence of chicory was not disclosed in the principal label a successful prosecution was instituted by the authorities in Sydney against the vendor of this brand. Under the new regulations this mixture can no longer be packed and labelled as it was.

Both samples of tea examined were genuine.

Of ninety-one samples of cream of tartar examined on importation only one fell below the standard, this one showing a deficiency of only one-fifth of one per cent. of hydrogen potassium tartrate. Thirteen samples of cream of tartar taken by inspectors were examined, and twelve passed the standard. One sample was a mixture in about equal proportions of superphosphate of lime and cream of tartar.

The six samples of custard and cake preparations were, as usual, starch powders with the addition of colouring matter and baking powder compounds.

Two samples of tinned fish passed, the remaining nineteen, which were all from one shipment, being unfit for human consumption.

Of the six samples of manufactured meat examined one sample of pork sausages contained 5.7 grains of boric acid to the pound. Two samples of

mince and three samples of sausages contained excessive amounts of sulphite preservative, varying from 6.2 grains, calculated as sulphur dioxide, to 21.8 grains to the pound.

Two samples of potted meat were fit for human consumption.

Four legal samples of pepper were received. Two were genuine, the others being mixtures of rice flour and pepper. In one case the rice flour was present to the extent of 30 per cent., and in the other 66 per cent.

The miscellaneous samples examined were rat baits, phosphate flour, brewer's hose, golden syrup, lemon cheese, washing compound, and a mosquito-destroying oil, consisting of shale tar oils, mineral spirit, and sodium resinate.

The preservatives received were sulphite compounds.

The samples of flour, ice cream, jams, jellies, and sauce were all passed as being fit for human consumption.

A sample of "Rat Murderer" depended on the presence of squill for its murdering properties.

The samples of vinegar were mixtures of acetic acid and water.

A sample of a well-known embrocation was found to consist chiefly of ammonia, soap, and turpentine.

In all food cases tried during the year the State Analyst's certificate was accepted. Mr. L. A. Meston is still doing nearly all the legal foods analyses, and in no case was he called as a witness.

The analytical work of the Health Department now takes up the time of more than one assistant. The present rate of increase of work for your Department cannot be maintained unless increased assistance and increased accommodation are provided. The only exception to this is in the case of milks; the provision already made for the analysis of milk samples would enable a larger number to be done without any increase in accommodation. As the work of all Government Departments increased last year the only hope for further expansion in general food work is in increased laboratory accommodation, every foot of space in the laboratory being now utilised.

I have, &c.,

J. BROWNLIE HENDERSON,

Government Analyst.

The Commissioner of Public Health, Brisbane.

## APPENDIX 5.

### REPORT ON AN INSPECTION OF THE TORRES STRAITS ISLANDS, AND VACCINATION OF THE ISLANDERS.

Department of Public Health, Queensland,  
Brisbane, 25th June, 1912.

Necessary preliminary arrangements for this tour (made in accordance with the instructions of the Honourable the Home Secretary) were completed early in April, and the undersigned left Brisbane for Cooktown on 5th April. Several days were employed *en route* in inspecting the recently established Northern Sub-office at Townsville. On 16th April the

Government steamer, "John Douglas," which had been placed at my disposal for this purpose, left Cooktown. Thursday Island was reached on 22nd April, and after refilling bunkers the tour was resumed on 24th April. The following islands were visited during the ensuing twenty-nine days:—Darnley, Murray, Stephens, Yorke, Cocoanut, Yam, Saibai, Dauan, Boigu, Nagheer, Badu, and Adam Village on Mua Island. The strong south-easterly winds, which prevailed, together with low tides, so



delayed progress that Maubyag Island and South Sea Village on Mua could not be included in the time at my disposal. With these exceptions the whole of those of the Torres Straits Islands, which are within the jurisdiction of Queensland and which carry any considerable population, were visited.

The sanitary conditions prevailing at each island visited were investigated, vaccination was offered and freely accepted by the islanders, the native Councils were addressed, appropriate methods of remedying sanitary defects were pointed out, and the principal features of local sanitation were discussed with the Government teachers stationed on the principal islands.

A full inquiry into the question of possible insect carriers of disease was conducted by Mr. Taylor, F.E.S., Entomologist to the Australian Institute of Tropical Medicine, whose valuable paper on the Culcidae and Ixodidae met with during the tour, is appended. Three new species of mosquito are described by him from specimens collected during this tour.

I.—VACCINATION.

One thousand two hundred and seventy-nine natives in all were vaccinated, representing some 71 per cent. of the total estimated population. The absence of a number of young adult males employed in the pearling boats in the Straits accounted in considerable part for the unvaccinated remainder. The work at Murray Island was hampered somewhat by the uncontrolled enthusiasm displayed in dinghy racing, a recently introduced sport of which the charms could not be wholly counterbalanced even by Mr. Bruce's influence in favour of vaccination. At Darnley Island the Council disappeared incontinently from the scene of action directly it became apparent that some work would be required for landing supplies for the new school, and vaccination also suffered from this cause. In all other islands visited, practically the whole population came in, and evident enthusiasm was displayed in securing the benefit of the operation, or the honourable and distinguishing mark of a white bandage.

The number of vaccinations according to islands and estimated populations was as follows:—

Island.	Population.	No. Vaccinated.	
		Males.	Females.
Darnley ... ..	320	72	56
Murray ... ..	440	136	145
Stephens ... ..	30	8	13
Yorke ... ..	80	44	31
Cocoanut ... ..	70	29	33
Yam ... ..	75	30	39
Saibai ... ..	300	98	115
Dauan ... ..	60	22	22
Boigu ... ..	97	46	38
Nagheer ... ..	30	13	11
Badu ... ..	230	117	91
Moa (Adam Village)...	70	23	36

The age distribution of persons vaccinated was as follows:—

	1-5 years.	6-10 years.	11-20 years.	21-40 years.	Over 40 yrs.	Total.
Darnley ... ..	19	24	37	36	12	128
Murray ... ..	37	46	78	87	33	281
Stephens ... ..	9	1	2	7	2	21
Yorke ... ..	16	5	8	37	9	75
Cocoanut ... ..	14	12	6	19	11	62
Yam ... ..	18	14	14	25	9	80
Saibai ... ..	58	37	34	56	28	213
Dauan ... ..	10	8	11	10	5	44
Boigu ... ..	23	14	14	33	11	84
Nagheer... ..	5	6	3	7	3	24
Badu ... ..	54	24	40	60	30	208
Moa Adam Village) ...	19	12	6	17	5	59
	282	203	253	394	147	1,279

In no case were any serious results reported to have followed the operation. A few "bad arms" doubtless occurred, but this was practically inevitable under the conditions. The site of vaccination was cleaned with water and spirit prior to operation. An antiseptic dressing was applied, and the necessity for cleanly treatment of the vaccination site was impressed on each person. A supply of dressings and ointment was left at each island with instructions for use. The vaccine was supplied from the Melbourne vaccine farm of the Federal Quarantine Bureau, and yielded excellent results. Reinspection was made at Darnley and Yam Islands only, owing to the weather conditions causing delay in transit, but natives seen at other places enabled an approximate idea to be formed of the results for most of the other islands. The case successes appear to have been well over 95 per cent., at a low estimate. The keeping qualities of the vaccine are shown by the fact that after being carried on deck, packed in sawdust and covered with wet bags, in an average atmospheric temperature of over 83 F., an unimpaired reaction of four insertions was obtained in an unvaccinated European from the last vial opened.

One drachm of vaccine was found to afford material for from 150 to 180 persons.

PHYSICAL CONDITION AND DISEASES OF NATIVES.

Generally speaking, the natives of the Torres Straits Islands are a remarkably healthy and well-developed people. Some exceptionally fine specimens of humanity were seen amongst them, and no evidence indicating any racial degeneracy through interbreeding, malaria, yaws, or ankylostomiasis was noted. They are stated to be increasing in number, and a large number of healthy children were seen. With due care and protection these people should afford some day a valuable source of labour for North Queensland and the Northern Territory, relatively free from the risks of disease and of disease-engendering habits of living, which are apt to be associated with most native races. It is evident that considerable inter-mixture of races has occurred during the past few decades, and this would appear to have exercised a beneficial effect on the physique and stamina of the islanders. Few half-castes of European blood were noticed, and the majority of these were of mature years.

The principal diseases noted or reliably reported were as follows:—

1.—Malaria.

This is stated to prevail during the north-west monsoon, especially at Murray, Darnley, and Boigu Islands. At Saibai and Dauan it is reported to have been formerly prevalent in the north-west season, but to have decreased of late years. The time of visit was not favourable to the study of this disease, and only one case (at Adam Village, on Mua) was seen. None of the ordinary clinical indications of high malarial endemicity were seen amongst the people anywhere in the islands. Careful search was made for Anopheline mosquitoes, but with disappointing results, the Nyssorhynchus annulipes, Walker, being the only species collected, and that only at Saibai Island.

The season of the year explains this. There appears to be no reason why, at small expense, malaria should not eventually be reduced greatly on the infected islands. A systematic inquiry into the breeding places of the local Anophelines could be readily arranged if an opportunity occurs to visit the islands during the wet season. Once this information is available the local school children could be utilised



as mosquito brigades, as a species of practical nature study. A free supply of quinine in charge of the local Government teachers would help the undertaking by immunising a certain proportion of the exposed population.

## 2.—Yaws.

Cases were seen, chiefly amongst children, at Darnley, Murray, Stephens, Yam, and Yorke Islands, and at Saibai, Dauan, Boigu, Nagheer, Badu, and Adam Village (Mua). The majority of these cases were in the secondary stage. Some thirty cases of somewhat extensive scarring of the body and limbs, with occasional contraction of joints or other evidences of gross tissue destruction, were seen amongst adults. In the only two active cases encountered these lesions suggested the effects produced by yaws rather than those of syphilis. The disease is susceptible of much reduction by more cleanly habits of living, such as are gaining popularity in the islands, under the guidance of the Government teachers, and is capable of specific cure by salvarsan.

## 3.—Filariasis.

Three cases of elephantiasis were examined at Murray Island, one at Darnley Island, one at Yama, and one at Dauan. All were leg cases. Elephantiasis is stated to have decreased of late years, both in these and in other islands where it formerly existed. It has evidently existed at Murray Island for many years, as Dr. Wilson, R.N., refers to a number of cases seen by him during a visit made in 1822. The *Culex fatigans* mosquito is credited with the power of spreading filaria, and was found at Thursday and Mulgrave Islands.

The mosquito inquiry and campaign referred to in connection with malaria could readily be made to include the *Culex fatigans* and *Stegomyia calopus*, both of which are essentially domestic in their breeding habits, and both of which are capable of carrying disease.

## 4.—Dysentery.

A severe form of dysentery, probably the bacillary form, is reported to have occurred of late years in the north-west season at most of the islands visited. An outbreak occurred at Darnley Island shortly after my visit, and resulted in several deaths. The incidence during the last season appears to have been light, but a serious outbreak occurred in the previous year, with a considerable number of deaths. If this disease is permitted to increase it will be a serious matter for the islanders, as it is one of the most fatal and crippling of all tropical illnesses. There is also considerable risk that it will be imported into North Queensland, where it might readily produce a serious complication in the labour question, in addition to illness and death. It appears to have reached the islands from New Guinea, where it has wrought much injury to the native and European population.

Protection against dysentery is largely a matter of personal and domestic hygiene. If the natives of the islands can be taught to eat and cook with clean hands only, and to safeguard their drinking water from excremental pollution, the risk will be much lessened. It will, no doubt, be difficult to overcome the lax habits of generations past, but an attempt should be made, especially in the schools. Proper disposal of the excreta from sufferers is another important feature in the control of the disease, and this can only be secured by teaching. The natives are evidently afraid of the disease, and by suitably directed effort and exhortation might be induced to take an interest in practical prevention. Care was taken to impress at every opportunity the sanitary teachings of Deuteronomy (23, 12-14) upon missionary teachers and other native churchmen.

## 5.—Ankylostomiasis.

This disease was suspected as the cause of some ten cases of breathlessness on exertion and vague abdominal symptoms, examined at Murray, Darnley, and Saibai Islands. The diagnosis could not, however, be settled with the means and in the time at my disposal, but may with advantage receive attention in any subsequent inquiry. Its control, should its existence be confirmed, will be attended by some difficulty, but the risk of infection can be materially reduced by proper methods of disposal of excreta.

## 6.—Other Intestinal Diseases.

No information was obtained to suggest the endemic presence of typhoid fever, sprue, or other serious intestinal diseases.

## 7.—Skin Diseases.

Cases of *Tinea circinata* were seen at Murray, Darnley, Yorke, Sabai, and Boigu Islands, and at Adam Village (Mua). This is stated to be prevalent amongst the coastal tribes on the opposite coast of New Guinea, where it is regarded as a mark of distinction. Cases of scabies were seen at several of the islands.

## 8.—“Boomerang Leg.”

One case of this curious and little-known condition was seen at Murray Island. It is stated to occur chiefly amongst children, and to begin with pain and deep-seated tenderness in the bones of the lower leg. As the disease progresses the bones soften and bow outwards, and the skin and underlying tissues are usually involved in a chronic inflammatory condition which slowly heals as the deformed bones become set in their new position. No evidence of syphilis, rickets, or tuberculosis could be obtained in the case seen. The disease is stated to be much less prevalent than in former days.

## 9.—Eye Diseases.

Only one partially-blind child was seen during the tour, and very few cases of eye-disease came under attention, with the exception of the chronic blepharitis which is met with amongst swim-divers. Trachoma and venereal diseases may thus be fairly excluded as common features of the epidemiology of the Torres Straits Islanders at the present day. Inquiries from experienced and reliable observers went to show that serious eye-disease and blindness are uncommon, and that infanticide of children born blind, or becoming blind soon after birth, is not likely at the present day. Three cases of trachoma were seen, however, in children at Adam Village (Mua), and care will be required to prevent the spread of this serious eye-disease. Its prevention is largely a matter of personal hygiene, and affords an additional reason for the inclusion of systematic health teaching in the educational curriculum of the island schools.

## 10.—Venereal Diseases.

Few cases ascribable to active syphilis were seen, and gonorrhoea is stated to be relatively rare. Non-artificial abortion is stated to be infrequent, and the numerous infants seen were for the most part healthy and robust. As already stated, blind children were not seen. Even if a considerable proportion of the cases ascribed to gangosa and tertiary yaws are in reality syphilis in aberrant form, this disease is relatively uncommon amongst the islanders at the present day.

Inquiry was made without result for cases of ulcerating granuloma of the pudenda.



11.—*Beri-Beri*.

Two cases ascribable to beri-beri were seen at Darnley Island. No evidence could be obtained bearing on the rice theory of the causation of this disease, but the consumption of polished rice has undoubtedly increased of late years in these islands. Polished rice is not apparently a staple diet of the shore population in any of the islands, however, and its use at all, save on board the pearling luggers, is of relatively recent date. The use of highly-milled flour is increasing, however, and may exercise an influence in the causation of the disease.

12.—*Consumption*.

Five cases of apparent tubercular pulmonary mischief were seen at Darnley, Murray, and Dauan Islands. The disease does not appear to be widespread at present, and the improved style of housing introduced of late years will tend to limit spread. The principal risk in connection with this disease arises from the likelihood of fresh infection being introduced by men who have been away in the pearling or bêche-de-mer boats.

13.—*Dengue*.

This disease is stated to occur at Murray, Darnley, and most of the other islands in wide-spread epidemics at intervals of a few years, with sporadic cases in the intervening years. As in the South, it occurs during the wet season. Direct mortality from this cause is stated to be rare. The conveying agent is probably the *Culex fatigans* mosquito, but the *Mansonia uniformis* is also blamed in this connection.

14.—*Gangosa*.

This rare and remarkable disease has been reported by observers in many widely separated parts of the world, including Guam, the Philippine Islands, New Guinea, Fiji, and doubt exists concerning its specific cause, some observers maintaining that it is an aberrant form of syphilis, whilst others regard it as a separate disease of the same group as syphilis and yaws. It has been mistaken for leprosy, but is clinically quite distinct. At the request of Dr. Breinl, Director of the Australian Institute of Tropical Medicine at Townsville, animal inoculations were made in monkeys from two cases.

Thirteen cases were seen in all, eight being at Murray Island, one early case at Darnley Island, two at Saibai, one at Dauan, and one at Boigu. Six of the Murray Island cases were described by Dr. Breinl in the Annual Report of the Australian Institute of Tropical Medicine for 1910, together with two others (Du and Alleta) who have since died. The disease is clearly referred to by Dr. Wilson, R.N., in an account of a visit made by him to Murray Island in 1822. The following table supplied by Mr. Bruce, Government teacher at Murray Island, gives the deaths occurring from, or complicated with, this disease since 1892.

1892	...	...	1 adult male.
1893	...	...	1 adult male.
1894	...	...	1 adult male—died of fever. 1 adult female.
1895	...	...	2 adult females—one early case. 2 adult females—one genital case.
1897	...	...	1 adult female. 1 boy.
1898	...	...	1 adult male. 1 adult female.
1899	...	...	2 adult males. 2 adult males.
1901	...	...	1 adult female. 2 adult males.
1902	...	...	2 adult females.
1903	...	...	1 adult female.
1904	...	...	3 adult males.
1905	...	...	1 adult male.
1907	...	...	2 adult males.
1908	...	...	3 adult males.
1909	...	...	1 adult male.
1910	...	...	1 adult female.
1911	...	...	1 adult male.

Mr. Bruce stated that these cases are practically always connected, by blood or marriage, with a particular tribe—the “Miriam.” This tribe is, by popular acceptance, the original tribe of the island, and, in old days, the men exercised full control over the women of all other tribes in respect of sexual congress. Mr. Bruce has noticed that cases in both husband and wife were not infrequent in the past, and that when one of an infected pair has died the disease in the other has begun to heal. From the histories given below it would appear that infection of husband or wife is not inevitable, and that it does not apparently cause abortion or interfere with the production of healthy offspring. The general characteristics of the disease are shown in the accompanying photographs, and a brief summary of each case will now be given.

## MURRAY ISLAND.

(1) — widow, about 37, seven children, four alive, survivors healthy except one boy, blind in one eye through an accident. Husband died of “throat disease,” also one of his brothers. Her father is stated to have had extensive sores on the legs similar to those in her case. Disease began about 1900, with small sores about the nostrils and adjoining parts of the cheeks. These spread into the nose, producing discharge and pain. The face at present is an ulcerated mass, especially in the lower part, but areas of young scar tissue and healthy granulation are to be seen here and there. The alae of the nose and the cartilaginous septum of the nose are destroyed, but the bones have not apparently been attacked. On the left wrist is a large excavated ulcer with raised edges, discharging greenish-yellow pus, and stated to have spread rapidly. Scars of extensive old ulceration are visible on the left lower leg, over the anterior surface of the tibia. No thickening of the bone is apparent. No thickening of nerves could be made out, and no anaesthesia.

(2) — male, about 55, married to Arkere, now suffering from this disease, which began after marriage. No children. Disease began about 1895. Left forearm is covered with scars stated to be due to an extensive ulcerative process. On tibial surface of the right leg several round ulcers exist, with thin scar-tissue and granulation tissue between. The right foot is much infiltrated and swollen, and a small area over the external surface seemed to be the site of a commencing ulcerative process. Pains about the right knee and about the right popliteal space were complained of, but no involvement of the joint or of the popliteal glands could be made out.

(3) — male, about 50. Widower, his wife having died of the same disease about 1895. They had been married some ten years before her death, and were both healthy at the time of marriage. The disease began in him about 1893, with sores about the alae of the nose, which extended into the nasal cavity and destroyed the fleshy and cartilaginous portion of the nose. Part of the bony structure of the nose has also been destroyed. The disease seems to have ceased in the nose. About the neck are traces of extensive old scarring, but he stated that this was not caused by the disease. Considerable scarring was also noted over the right deltoid and scapula, stated to have been caused by the disease. Five children were born of the marriage; one died of “throat disease” at the age of 14, about 1904. Another son, Kaikai, aged about 20, has recently developed suspicious signs about the larynx.

(4) — wife of Kuriwa, married about 1878; both healthy at the time. No children. Disease stated to have begun about 1905 with the usual history of small ulcers about the cheeks and nose. The



fleshy and cartilaginous portions of the nose are destroyed, and the face is extensively involved. The fingers of both hands are contracted and deformed. Close examination of this case was not feasible.

(5) —, male, about 20. His mother died of the disease, his father is healthy. Illness began about five years ago, in the usual way. The flesh and cartilaginous portions of the nose have been destroyed, and the bony structure partly eroded. The scars about the cheeks, nose, and upper lip appear healthy, and the stout scar tissue has drawn the upper lip and mouth out of shape. In the soft palate to the right of the median line is a patch of ulceration about a quarter of an inch in diameter. The larynx is thickened over the thyroid cartilage, but no pain or tenderness is stated to occur. Over the left heel the skin is thickened and tender to the touch. The left os calcis is enlarged posteriorly, and the bone thickened. No enlargement of the ulnar or peroneal nerves could be made out.

(6) —, male, about 42, married twice. First wife died of another disease, and left one boy, who is healthy. Second wife has had three children, and all are in good health. Illness began about 1904, in the usual way. Cartilaginous and fleshy portions of the nose have been destroyed, and the bony framework has been eroded. The soft palate and pharynx show scarring of old date.

(7) —, female about 45, six children, two have died, remainder in good health, except one who is stated to have had "swellings" in the neck. Her husband is in good health. They have been married for some 25 years. Her disease began about 1901, with the usual early history. The whole nose has been destroyed, and the face is a mass of ulceration and granulation, discharging a greenish-white pus. The hands and arms are extensively involved, especially the left hand. The wrist is reduced to about the size of two fingers. The feet and legs are deeply and extensively ulcerated. The disease is evidently progressing rapidly.

(8) —, female, about 38, married. Her husband and three children are in good health. One child died in infancy. Disease began after marriage, about 1903, with the usual history. She refused examination.

#### DARNLEY ISLAND CASE.

(9) —, a native of Darnley Island, about 35 years of age, son of Timoto, who died of the "Nose disease" when the present case was a boy. Married; wife and children free from traces of the disease or of syphilis. States that he had never had any venereal disease. Has been out of sorts for the last six months, and has lost flesh. Facial expression heavy and despondent; this has been noticed by the Government teacher, who stated that the man's expression had altered remarkably during the past few months. On examination the nose was found to be swollen and tender across the bony structure, with tenderness over the left ala on pressure. A yellow discharge was crusted about the nostrils on both sides, and the nose was blocked with crusts and dried pus. No ulceration existed on the cheeks or about the nostrils. The breath was foul and the voice nasal in tone. The fauces showed small patches of indolent ulceration, with slight loss of tissue, and tenderness existed on pressure over the palatal arch. Yellow pus and mucus were noticed at the back of the pharynx, apparently running down from the posterior nares. No traces of the disease on the body.

#### BOIGU ISLAND CASE.

(10) — male, about 40, married, wife healthy, and one child also healthy. No still births

or premature births stated. Nose disease began several years ago after marriage, commencing on the outside of the bridge of the nose. Soon after this he had a large sore on the right elbow, which took a long while to heal. On examination the nose and adjacent cheeks are much pitted and scarred, and the alae and cartilages are partially destroyed. The bony structure is apparently not involved. The upper lip has not been involved in the nose-condition. No traces of ulceration are apparent about the soft palate or fauces, but an old healed scar is in the roof of the mouth. The mouth is stated to have been sore during the active stage of the disease. There are extensive old scars about the right elbow and the outside of the upper arm, ascribed to the disease. The face condition has healed, and there is no evidence of any active disease anywhere about the body.

#### SAIBAI ISLAND.

(11) — female, about 25 years of age. Twice married; first husband, Kada, died of "short-wind" (probably consumption) three or four years ago, had no trace of this disease. Two children by him, both living and healthy. Present husband, Daiida, healthy and strong man. One child by him, healthy, born less than one year ago. Disease began about fifteen months ago, with irritation and discharge from within the nostrils. Not much pain. No history of syphilis. The bony structure of the nose has disappeared, leaving the tip and alae, with a large opening above through which the back of the naso-pharynx can be seen. The margins and interior of the opening are foul and ulcerated, with yellow crusts and granulating edges. In the roof of the mouth the hard palate shows traces of indolent ulceration with undermined edges, extending through from the nose. Fauces healthy, but some traces of scarring in the mucous membrane of the cheeks. On fibular surface of the right lower leg is an ulcer of irregular outline, about 6 by 3 inches, with thickened edges, granulating surfaces and yellow crusts in places, discharging a thin, somewhat foul-smelling pus; similar in general outline and appearance to Kuriwa case on Murray Island.

(12) — female, about 30. Twice married. First husband died of fever contracted in New Guinea, at Saibai, some five years ago. Stated to have been a strong, healthy man. Four children by him, all now dead. Present husband, Waigana, a strong, healthy man. Three children by him, all living. Disease began about six years ago, with running and discharge from the nostrils, and is now stated to be healing. No history of syphilis. On examination tip and cartilage of nose has disappeared, and also the centre part of the upper lip, leaving an irregularly shaped opening into the nasal cavity and drawing up the lip by contraction of the scar-tissue. The nose opening has also contracted up from its evident former dimensions. The cartilaginous septum is partially destroyed. Surfaces are mostly healthy scar tissue, with a few small patches of healthy granulations. Traces of old healed ulceration about the fauces. Healed scars covering a considerable area on left wrist and hand are stated to date back to the beginning of the nose disease. These are described as ulcers which took a long while to heal. The disease is stated by natives to have been known for many years at Saibai, and is said by them to be limited to women. No connection between these cases and Murray Island, whether directly or through the husbands, was elicited on questioning. The condition is known as Wateparu, or "Evilface," amongst the natives, or as "half-nose" in pigeon English.



## DAUAN ISLAND.

(13) —, female, about 35, married, four children, one still-born at full term after long labour, others living and healthy. Is a Saibai woman. Disease began nearly twelve years ago, with internal inflammation and discharge from the nose, stated as occurring first on the left side. On examination fairly well nourished. Alae and cartilages of the nose have gone, and upper lip has been pulled up by scar-tissue, as in the case of T (12) at Saibai (see notes), whom she resembles. Traces of old ulceration about inside of lips, and fauces. No ulceration or history of ulceration about body or limbs. No history or general evidence of syphilis. Disease in nose apparently healed, edges and base of wound being covered with healthy scar tissue. No foul odour, no granulations evident externally.

## GENERAL SANITARY CONDITIONS.

The general sanitary condition of the villages was distinctly good. The usual type of house is built of plaited cocoanut leaves, with grass roof, and is raised well off the ground. The floors are of split bamboo, and, together with the wall openings, permit free ventilation. These have replaced the old beehive-shaped grass hut in which a whole family herded together with their friends, dogs, and pigs on the earthen floor in a closely confined smoky atmosphere. The village at Saibai (*see photograph*), as reconstructed under the skilful and energetic direction of Mr. Williams, Government teacher, affords a particularly notable example of what can be and has been done in this direction. The houses are well built and commodious, excellently suited to the climate (*see photographs in body of report*), their surroundings and interiors are kept scrupulously clean, and they are so placed and aligned as to permit free air-access to all parts of the settlement. A considerable part of the foreshore of the lagoon at the rear of the village has also been embanked, and this is stated to have already diminished the former mosquito-pest to a notable extent. In former days Saibai had the reputation of being the most insanitary, untidy, and unhealthy village in Torres Strait.

The necessity for due care and cleanliness in the disposal of excreta was constantly impressed on native councils, and served to emphasise the similar teaching of the various Government superintendents. All the villages seem well situated close to the beach, which is used in most cases as the place for defaecation. So far as can be ascertained on close inquiry little risk arises from this method. The introduction of chamber pots as a feature of domestic furniture has occurred during late years, and is probably responsible, through hand contamination and fly-transference, for a proportion of cases of dysentery and other acute intestinal diseases.

As is elsewhere indicated, lessons in domestic sanitation, especially in connection with the necessity for prompt removal of excreta from about houses, for its protection from flies, for protecting domestic water supplies from excretal pollution, and washing the hands before preparing or partaking of food, should be included in the school curriculum, and made freely public amongst the natives. A notice should be printed in the vernacular and displayed in each house, at the council chambers, and at the school. A suitable form for paraphrasing into the vernacular would be as follows:—

## READ THIS CAREFULLY AND PRACTISE IT.

(1.) Dysentery, worms, and other serious diseases are spread by the discharges from the body.

(2.) These discharges should never be allowed to remain in or about the house. If they are received in a chamber pot this should be at once taken outside, and emptied in a safe place, such as the sea, or put into a hole in the ground and covered with earth. The pot should be well cleaned and washed or scalded out before it is taken back to the house.

(3.) If persons use the beach or the bush for defaecating they should cover the material over with sand or earth. If the beach, it should be below high water.

The Bible (Deuteronomy xxiii., 12-14) says:—

“Thou shalt have a place also without the camp, whither thou shalt go forth abroad:

“And thou shalt have a paddle upon thy weapon; and it shall be, when thou wilt ease thyself abroad, thou shalt dig therewith, and shalt turn back and cover that which cometh from thee:

“For the Lord thy God walketh in the midst of thy camp, to deliver thee, and to give up thine enemies before thee; therefore shall thy camp be holy; that he see no unclean thing in thee, and turn away from thee.”

Those who are uncleanly and dispose of their discharges about their dwellings thus disobey the Bible.

(4.) Every person who is about to cook food or to eat it should wash the hands carefully before touching it. Infection is often carried by unwashed hands even though they may look quite clean. In eating food, clean spoons and forks are cleaner and safer than the fingers.

(5.) Flies can carry filth on their feet and bodies to food and drink. Keep them away by covering up all cooked food or food which is eaten raw.

(6.) If dysentery comes into your village, do not, if you can avoid it, go into houses where the sick people are. If you must, do not eat or drink anything in that house, or anything that has come from it. Be very careful to wash your hands before eating or cooking food. If possible, boil water before you drink it, or if this is not possible see that your drinking water is taken from a clean place.

Remember that disease is not sent by God and that it can be avoided.

Disease usually comes to men by their own carelessness and dirtiness.

The personal habits of the natives as regards cleanliness are capable of much improvement. Particularly is this the case in connection with the preparation and eating of food. Dysentery and similar diseases can be readily conveyed by unwashed hands and fingers, and this has probably played no inconsiderable part in the outbreaks of the former disease which have occurred of late years.

One of the most practically valuable lessons which can be taught to these receptive and intelligent people is that of personal cleanliness in respect of cooking and partaking of food, and it should be impressed upon them by all reasonable available means.

## RECOMMENDATIONS.

(1.) An inspection by a medical officer versed in sanitation and tropical medicine should be made of the inhabited islands at least once yearly, with a view to vaccinating children and adults not already protected, assisting the Government teachers with advice and backing in sanitary matters, and keeping the disease question under active observation. If weather conditions permit, this should be made during the north-westerly season, when malaria and dysentery are at their maximum seasonal prevalence.

(2.) Systematic teaching in elementary sanitation, applicable to the local conditions, should be included in the regular curriculum of the native schools.

(3.) A simple-remedies outfit in a suitable fitted chest should be supplied to each Government teacher, who should be required to requisition for replenishments as occasion arises.



(4.) A spray-pump for disinfection, mosquito-work, &c., should be supplied to each Government teacher, with a stock of disinfectant and larvicide, and brief instructions for the use and care of the apparatus.

(5.) One room in each Government teacher's house, or at least a part of the room large enough to hold a table and chair, should be rendered mosquito-proof by brass or bronze gauze of twenty wires to the inch mesh. This is essential to reasonable comfort, and for protection against fever-bearing Anophelines. Teachers should be required to keep their water-tanks and any similar collections of water about their houses regularly oiled with kerosene or otherwise effectively protected (as by wire screening) against mosquito-breeding.

(6.) Where new houses are built for teachers, due provision should be made for coolness by means of wide (8 ft. to 10 ft.) verandahs, liberal window-space, and screened openings between the walls and roof. Galvanized-iron is not a suitable material for houses in tropical climates, and although difficulties and cost of transit of material are recognised, it is

suggested that reinforced concrete, or material of the fibro-cement class, would yield more economic results in the long run. The conditions of life for teachers in these islands are hard in many ways, and reasonably cool and comfortable living-quarters would do much to conserve health and maintain working powers.

Grateful acknowledgment is made for much useful assistance and information received during this tour from Mr. Lee Bryce, Government Resident, Thursday Island; Dr. Wassell, Government Medical Officer, Thursday Island; Captain George Kerr, of the Government steamer "John Douglas;" Mr. Bruce, Government teacher, Murray Island; Mr. Guilletmot, Government teacher, Darnley Island; Mrs. Smallwood, Government teacher, Yama Island; Mr. Williams, Government teacher, Saibai; and Miss Richards, Acting Government teacher, Badu.

J. S. C. ELKINGTON,  
Commissioner of Public Health.

The Under Secretary, Home Secretary's Department.

## APPENDIX 6.

### CONTRIBUTION TO A KNOWLEDGE OF THE CULICIDÆ AND IXODIDEA OF NORTH QUEENSLAND AND THE TORRES STRAIT.

By FRANK H. TAYLOR, F.E.S.

The following notes and descriptions are based on a small collection made during April and May of this year:—

Mosquitoes are apparently very scarce throughout the Strait, judging from the number of specimens taken during the south-east monsoon season, though they are said to be very plentiful during the summer.

*Nyssorhynchus annulipes*, Walker.

Ins. Saund., 1, 433, 1850; Theobald, Mon. Culicid., V., p. 57, 1910.

This species was only met with at Saibai, the lateness of the season probably accounting for its absence from the other islands, for it undoubtedly occurs at Murray and Darnley Islands, as the natives suffer to some extent from malaria. It has been recorded from Mulgrave (Badu) Island.

*Stegomyia fasciata*, Fabr.

Syst. Antliorum, 36, 13, 1805; Theobald, Mon. Culicid., V., p. 158, 1910.

This ubiquitous mosquito was commonly met with throughout the Strait, except on three islands, Dauan, Saibai, and Boigu, where it was entirely absent owing to the fact that the water supply was contained in wells at a considerable distance from the villages, only sufficient for the immediate use of the villagers being drawn at a time.

It is particularly prevalent in Thursday Island, where the entire water supply is contained in iron tanks. An examination of the water tanks in the Japanese quarters showed the presence of larvae in all the tanks. It is more than probable that the tanks in the European and Chinese quarters are similarly infected, as the adults are in their shops and houses. It is also very plentiful at Cooktown and Somerset, North Queensland.

*Macleaya tremula*, Theobald.

Mon. Culicid. V., p. 218, 1910.

The collection contained a single damaged specimen, which agrees fairly well with Theobald's description. It was taken on Cairncross Island.

*Pseudoskusea similis*, Theobald.

Mon. Culicid., III., p. 293, 1903; IV., p. 192, 1907; V., p. 188, 1910.

Additional locality: Somerset, N.Q.

*Culex fatigans*, Wiedemann.

Auss. Zweit. Ins. 10, 1828; Theobald, Mon. Culicid., V., p. 383, 1910.

Thursday and Mulgrave (Badu) Islands were the only localities where it was observed.

*Pseudoskusea basalis*, N. Sp.

Head, black. Thorax black, clothed with bronzy, narrow-curved scales. Abdomen clothed with brown scales with narrow, irregular, white basal bands on most of the segments. Legs, brownish black.

♀ Head covered with brown, flat scales with bluish violet reflections, base of the head with black, upright forked scales; clypeus deep amber brown; palpi clothed with brown scales, the last segment with moderately long blackish hairs; antennae black, covered with brownish pile, basal, half of the second segment pale yellowish; eyes, deep violet blue and golden.

Thorax black, clothed with bronzy, narrow, curved scales, with a lateral border of fairly long hairs (in some lights the scales appear to be bronzy black); prothoracic lobes prominent, clothed with bronzy, narrow, curved scales, and fairly long, brown bristles; scutellum black, with the mid lobe clothed with pale, bronzy, narrow, curved scales, the lateral



lobes sparsely clothed with bronzy, narrow, curved scales, seven long dark-brown posterior border bristles to the mid-lobe, and four to each of the lateral lobes; metanotum, brownish black; pleurae, dark brown, clothed with patches of white, flat scales and a few short dark hairs.

Abdomen black, clothed with brown scales with bluish reflections, first segment with brown scales and fairly dense brown hairs, second segment with a basal median white spot, segments three to six, with a narrow basal white band, segments two to seven with white basal lateral spots, border bristles brown; venter black, clothed with brown scales, ochraceous in some lights, last two segments clothed with brownish black scales.

Legs brown with femora pale beneath; coxae and trochanters pale yellowish brown, coxae clothed with whitish scales and short brown bristles, ungues equal and simple, the hind ones somewhat straighter than the fore and mid ones.

Wings pale creamy, the veins clothed with brown scales, dark-brown on the costa and the first long vein, lateral scales moderately long and linear; first sub-marginal cell longer and narrower than the second posterior cell, base of the former slightly nearer the base of the wing than that of the latter; stem of the first sub-marginal cell about half the length of its cell; marginal cell larger; posterior cross vein longer than the mid-cross vein and about its own length distant from it; halteres with pale creamy stem and brown knob.

Length: 4.5 to 5.0 mm.

Habitat: Cooktown, North Queensland.

Observations: Described from four ♀. They were taken in the bush towards sunset. They are vicious biters. It is easily distinguished from its congeners by the abdominal banding.

*Culex saibaii*, N.Sp.

Thorax brown, covered with brown, narrow, curved scales. Abdomen brownish-black with basal bands of white scales. Legs brownish-black.

♀ Head dark-brown, clothed with pale creamy narrow, curved scales with numerous black, upright forked ones on the occiput and sides, with a patch of flat, pale creamy white scales on each side; eyes deep blue-black with a reddish tint on upper margin; palpi dark-brown with fairly long hairs on the outer edge, very short on the last segment, the apex of the latter pale creamy; proboscis dark-brown with a narrow, pale creamy band towards the apex of the middle third, apical third blackish; antennae dark-brown, covered with short whitish pubescence, basal lobe pale, testaceous on outer edge, blackish with small, flat, white scales on the inner edge, basal half of second segment pale, testaceous; clypeus dark-brown.

Thorax dark chocolate brown, clothed with brown, narrow, curved scales; a pale spot of whitish, narrow, curved scales on each side of the thorax above the prothoracic lobes; a small, narrow, oblong area of whitish, narrow, curved scales extending from the base of the scutellum to a little beyond the origin of the wings; two lateral rows—one on each side—of dark-brown hairs, fairly long and moderately dense towards the apex of the mesothorax, a second row on the edge of the mesothorax, numerous and fairly dense at the base of the wings; prothoracic lobes prominent, clothed with brown, narrow, curved scales and moderately long, brown bristles; scutellum brown, slightly paler than the thorax, clothed with whitish, narrow, curved scales, seven brown bristles on the posterior

border of the mid-lobe and three on each of the lateral lobes; metanotum dark-brown; pleurae chocolate-brown, with a few patches of flat, white scales and a few scattered yellowish hairs.

Abdomen brownish-black with white lateral spots, first segment brown scales and numerous brown hairs, segments two to six with white basal banding, the band on the second being about half the width of the segment, seventh segment with an apical patch of white scales, eighth segment with a narrow basal white band; posterior border, except that of the first, with a thin fringe of short, pale creamy white hairs; last segment with the apex clothed with pale hairs; venter dark-brown with broad basal white banding.

Legs brownish-black; coxae and trochanters pale ochraceous, the fore and mid coxae with a patch of brown on the outer edge; femora pale, scaled beneath with a small apical patch of creamy scales, tibiae with small apical and basal patches, the basal one making, with the apical femoral patch, a creamy knee spot; first three tarsi of the fore and hind legs with pale creamy basal banding; remainder unbanded, first and second tarsi of mid leg basally banded; ungues equal and simple.

Wings with the veins covered with brown scales; costa, sub-costal, and first longitudinal veins deep-brown; first submarginal cell longer and slightly narrower than the second posterior cell, the base of the latter slightly nearer the base of the wing than that of the first sub-marginal cell; stem of the latter slightly more than half the length of its cell, stem of the second posterior cell almost the length of its cell; posterior cross vein about the length of the mid-cross vein and about twice its length from the mid-cross vein; fringe brown.

Length: 5.5 mm., excluding proboscis.

Habitat: Saibai Island, off the coast of the western division of British New Guinea.

*Culex somerseti*, N.Sp.

Thorax black, clothed with pale-golden, narrow, curved scales. Abdomen clothed with black scales, basally banded. Legs with the tarsi black.

♀ Head brown, clothed with very pale brown, narrow, curved and pale flat scales on the sides, the centre clothed with creamy white, narrow, curved and upright forked ones, and numerous dark-brown upright forked ones, a scanty row of brown bristles overhanging the eyes, with a few pale yellowish-brown ones at the vertex; eyes deep purple-black; clypeus brown; palpi black, scaled with a few pale scales and brown hairs on the third segment, apex with a small patch of pale scales; proboscis blackish-brown with a creamy band towards the centre; antennae light brown, whitish pubescence, the basal joint testaceous, second joint pale, testaceous at its base.

Thorax black, clothed with pale-golden, narrow, curved scales, a small patch of pale ones between the creamy ones extending from opposite the origin of the wings to the base of the scutellum, numerous brown and golden bristles on the lateral edges, denser at the roots of the wings; scutellum dark-brown, clothed with light-brown and whitish, narrow, curved scales, posterior border of mid lobe with seven golden bristles and the lateral lobes each with five; metanotum brown; pleurae brown, clothed with patches of white scales and scattered yellowish-brown hairs.

Legs brown with creamy white banding; coxae and trochanters creamy yellow, coxae clothed with a few brown scales; femora brown above with a narrow basal band, whitish beneath, a creamy spot at the apex; tibiae with a basal and apical spot, the apical





Fig. 1.—*Rhipicephalus sanguineus*, Lat.



Fig. 2.—*Ripicephalus sanguineus*, Lat.



Fig. 3.—*Rhipicephalus sanguineus*.







femoral spot and the basal tibial spot forming a creamy knee joint; first tarsus of fore leg with apical banding, second and third tarsi with basal and apical banding, fourth basally banded, fifth unbanded; first to third tarsi of mid and hind legs with basal and apical banding, fourth basally banded, fifth unbanded; first tarsus of hind leg as long as the tibia; unguis equal and simple, hind ones not so strongly curved as those of the fore and mid.

Wings with brown scales and brown fringe; costa dark-brown; median vein scales small, slightly larger on the sub-costal and first longitudinal veins, the lateral scales fairly long and linear; first sub-marginal cell longer and slightly narrower than the second posterior cell, base of the former slightly nearer the base of the wing than that of the latter; stem of the first sub-marginal cell less than half the length of its cell, that of the second posterior cell more than half the length of its cell; posterior cross vein as long as the mid cross vein, and about twice its length from it; the sub-costal joins the costal slightly before the base of the first sub-marginal cell; the second incrossation (Austen's sixth longitudinal vein) is easily seen; halteres creamy white with a black knob.

Length: 4.5 mm.

Habitat: Somerset, North Queensland.

Described from a single specimen taken in the bush at Somerset, North Queensland. It is closely related to the previous species, *C. Saibaii*, N.Sp., but the leg banding easily separates it.

## *Ixodidae* or *Ticks*.

### Sub-family Rhipicephalae.

#### *Rhipicephalus sanguineus*, Latreille.

Gen. Crust. Ins., V. 1, p. 157, Figs. 16 and 17, 1906 (Ixodes); C. L. Koch, Arch. Naturg., V. 101, p. 238, 1844 (Rhipicephalus); L. G. Neumann, Das Tierreich, Beg. v. Deut. Zoolog. Gesellschaft, 26, p. 35, 1911.

Specimens of the above were found on a dog at Somerset, North Queensland. They could only be found on its head and neck, where they were very numerous (Plate—figs. 1-3).

It is a previously unrecorded species for North Queensland, though Gilruth\* has recorded it from the Northern Territory from the same host.

### EXPLANATION OF PLATES.

Fig. 1. Stigma of *Rhipicephalus sanguineus*, Latr. ♂

Fig. 2. Coxæ of *Rhipicephalus sanguineus*, Latr. ♂

Fig. 3. Tarsus IV. of *Rhipicephalus sanguineus*, Latr. ♂

Figures 1 and 3 were drawn with the aid of the Zeiss Camera Lucida, and using Zeiss ocular 4 and objective A; ocular 1 and objective A were employed for fig. 2.

## APPENDIX 7.

### REPORT ON MOSQUITO-SURVEY OF EIGHT SELECTED AREAS IN BRISBANE.

Department of Public Health, Queensland,  
Brisbane.

SM,—A preliminary inquiry into mosquito prevalence in Brisbane was begun on 19th January, 1912, and continued to April.

Eight areas were selected for investigation.

The districts examined were New Farm (blocks A and B); Bowen Bridge and Bowen Hills (block C); West End (block D); Red Hill and Paddington (block E); Brisbane (block F); Highgate Hill (block G); and Hamilton (block H).

Block A is bounded on two sides by the Brisbane River, and on the other two by Barker street and Lower Bowen Terrace. Towards the lower end of this district the height is only that of river level.

Block B is bounded on two sides by the Brisbane River, and on the remaining two by Roberts street and Lower Bowen Terrace. The lowest portion is at river level.

Block C is bounded by the following streets:—Brunswick street, Bowen Bridge Road, Campbell street, Markwell street, and Leichhardt street. The lowest part of this block is on river level.

Block D is bounded on one side by the Brisbane River at Milton Reach, and by the following streets:—Vulture, Boundary, and Upper Melbourne streets. The lowest part is about six feet above river level.

Block E is bounded by Given Terrace, Cochrane street, Musgrave road, Stoneleigh street, and Dowse street. This averages about 150 feet above the level of the river.

Block F is bounded by the river on one side, and on the other side by Queen, George, and Alice streets. The lowest part averages about six feet above river level.

Block G is bounded by Gloucester street, Gladstone road, Annerley road, and train line. It is about 190 feet at its maximum height above river level.

Block H is bounded by Hamilton road, Racecourse road, Lancaster street, Towers street, Morgan street, Gaythorne street, and Albion road.

Every house was examined in blocks A and H, and every alternate house in the remaining blocks. Dwellings and other public or private buildings were examined, and a careful inspection was made on vacant lots, streets, marshy land, &c. Land being filled in with rubbish was also carefully examined. Full instructions were given to householders visited as to the reduction of mosquitoes, and to prevent the possible breeding of them outside as well as inside. The "Mosquito Reduction" pamphlet was distributed to every house.

Experimental trials were made with small-scale destruction measures. For natural waters where larvæ existed larvicides were frequently sprinkled over the water in sufficient quantity to kill the larvæ instantly. In the case of salt water swamps, "phino-

\* Gilruth, Bull. No. 1 Northern Territory, p. 28, 1912.



tas" could not be used, and petrolite was utilised. Waters containing natural enemies of mosquito larvæ were not interfered with.

#### DISTRIBUTION OF SPECIES IN BLOCKS.

A tabular form of inspection results for the various blocks is attached, and from this it will be seen that certain species of mosquitoes are largely confined to certain places, according to the topographical position of the district in which they exist. For instance, *Culex vigilax* (a salt-water breeder) was most prevalent at Blocks A, B, and C, and part of H. *Stegomyia fasciata* prevails at Blocks D and E, and *Culex fasciata* and *C. fatigans* were present more or less in all blocks, but *C. vigilax* was largely confined to salt water country. New Farm, Bowen Bridge, and certain parts of Hamilton are the most low-lying districts mentioned. They are also near salt water, and during king tides they get an excessive amount of salt water, which is left stagnant, and breeds *C. vigilax*. One can safely assert that this mosquito is primarily a coastal mosquito (or rather a mosquito confined to salt or brackish water), and that it will not breed even in a coastal district if the land is well above sea level. The adults may, of course, travel to higher levels. This was proved by the state of affairs at West End, Brisbane, Red Hill, Paddington, and Highgate Hill, which are situated at higher levels, thus not allowing water to stagnate on banks after spring tides.

When *C. vigilax* showed a decrease in number (about late in March) *C. annulirostris* occupied its breeding grounds. Late in May, imagines of *C. vigilax* were totally absent (although its larvæ were detected) and *C. annulirostris* abounded in its place.

One noteworthy incident was that of having treated a salt waterhole at New Farm with "Izal," resulting in the total destruction of all larvæ and pupæ therein. After the waterhole dried up a downfall of rain occurred. The same species of mosquito (*C. vigilax*) was soon found to be breeding in large numbers in the fresh water, which soon afterwards became brackish.

#### *Stegomyia fasciata*.

The prevalence of *Stegomyia fasciata* in a district, be it an inland or a coastal one, appears to be influenced by people and their habits, and not by contour of land. *Stegomyia fasciata* was found only in inhabited districts, and very seldom in the bush. Where mosquitoes were troublesome in a house, they were almost invariably bred in that or in the contiguous premises. This is especially the case with *Stegomyia fasciata*. The relative abundance of this species about any given premises is affected mainly by tanks, and other receptacles outside as well as inside the house. Occasionally they will be found in bedroom water jugs, flower-pot saucers, containers under the legs of safes, and I once found them breeding in the filtered water in a charcoal filter. The females had probably entered by the thumb pieces, which were left uncovered. I have also found this species breeding in water in the bottom of an inverted barrel, and in another instance in a dry banana leaf that had curled up. Fowl's drinking syphonic troughs in all cases harboured *Stegomyia* larvæ. Out of all the tanks examined only three were found to contain larvæ of *Culex fatigans*, and one contained *C. tigripes*. I have never come across *Stegomyia* larvæ in natural water collections, they prefer clean water in artificial receptacles. *Culex fatigans* will rarely be found in tanks; they are found in the majority of cases in small gullies, puddles, gully traps, and dirty water in old tins about the yard. Liquid manure barrels are favourite breeding places for this species. If the water is clean in old tins, *Stegomyia* larvæ will nearly always be found breeding in them. Occasionally these two species will be found breeding together.

#### *Culex fatigans*.

*Culex fatigans* was generally found in all the districts examined. The prevalence of this genus is influenced by (a) people and their habits, and (b) by contour of land. Puddles and ill-kept yard drains about houses are favourite breeding places. Street gully traps form their chief breeding places in a city, and small areas of stagnant water act similarly in urban districts. In almost every street gully trap examined its enemy, *C. tigripes*, accompanied *Culex fatigans*, but the latter multiplies notwithstanding. Unlike *Stegomyia*, this species prefers natural water collections, but will also be found at times in artificial water containers. Early in February I found *C. fatigans* breeding in blacksmiths' cooling troughs, which had been temporarily disused during the strike.

#### TANKS.

It was found that larvæ were relatively abundant in tanks that were uncovered, i.e., the inlet not provided with a strainer or cover of any kind. The kerosening of tanks had been undertaken by some, and in many cases larvæ were found in tanks so treated. This resulted either from an insufficient quantity being put in, or if enough was applied it was irregularly done. Some people seem to kerosene their tanks before rain, but not to trouble about a subsequent oiling till they think of it. However, in tanks where one tablespoonful of kerosene was inserted every week no larvæ were found. Temporary screening with muslin or mosquito netting had been accomplished by only two householders, one in Block B, and the other in Block F, and no larvæ were found in the tanks so treated, although the elbowed overflows were not screened. In tanks screened with brass wire gauze no larvæ were present, although in one case the screen was wrongly fitted.

Larvæ of *Culicella annulirostris* were found in a disused well. This well contained so much green algae that the larvæ were actually coloured green, and their size was abnormal.

#### STREET GULLY TRAPS.

Street gully traps were frequently found to breed large quantities of *C. fatigans* and *C. tigripes*. When these gullies were examined, after rain, larvæ were absent. Hence the reason for the relative absence of larvæ in Blocks E. and G. Twenty-five hours after a downfall of rain I have seen numerous egg rafts on the surface of the muddy water contained in these gully traps. For mosquito-prevention purposes I do not think it would be of any practical value to flush these out, as it would result in the transportation of larvæ through the sewer, and thence to the natural watercourse in which it discharges—as in the case of the sewer leading into Victoria Park. One advantage of larvicides in these is that they would tend to collect at the outlet of the sewer.

#### FLIGHT OF MOSQUITOES.

##### *C. vigilax*.

The range of flight of this mosquito seems to be at least one mile. On inspection of the Hamilton block it was found that the nearest breeding place from a certain house infested with this species was situated at a distance of about a mile. All the inhabitants about this house similarly complained of the activity of mosquitoes, saying (1) they were most numerous in westerly winds; (2) they were numerous outside rather than inside, especially in gardens, on verandas, and about foliage. To confirm No. 1, the only breeding place discovered after careful search was situated to the west of this part of the district.

This appears to indicate that *C. vigilax* is carried, or rather allows itself to be carried, by winds, and that the distance so travelled may be at least one mile, and probably more.





TYPICAL BREEDING PLACE OF CULICELSA VIGILAX. SALT WATER.



BREEDING PLACE OF CULICELSA VIGILAX. SALT WATER.









COLLECTOR'S OUTFIT.







### NATURAL ENEMIES OF MOSQUITO LARVÆ.

Several experiments were carried out with these, the most voracious of which seems to be the firetail (*Austrogobio galei*). The green perchlet (*Priopis olivaceus*) is also an active feeder on larvæ. These species are common in small streams. Though the Barbadoes "millions" will keep a pond quite clear of larvæ, it does not seem to be so determined as our fish. It was found from observation on specimens that if these fish are accustomed to feed on biscuit, it will be some time before they have any liking for the larvæ.

Notonectidæ (back-swimmers) also destroy larvæ, but these are quite insufficient to keep a check on them. One advantage about them is that they prefer water that is too shallow for fish, such as that in puddles left by cows' hoofs in mud. Though they are voracious enough they take quite a long time to eat their victims. They can travel from one puddle to another. At New Farm there were two swamps side by side. In one of these back-swimmers were abundant, while in the other they were absent, but after a day or two they left their old quarters and occupied the adjacent swamp.

Tadpoles do not seem to exercise any check on larvæ. I have once seen one in the act of eating a larva, but I think this was rather an exception to the rule, for, when the same lot of tadpoles was confined with a definite number of larvæ for a few days no change resulted. Larvæ were frequently absent where tadpoles existed, but the conclusion that the latter are larviverous is not justifiable, as on several occasions tadpoles were found in company with large numbers of the larvæ of *Culex fatigans*.

### LARVICIDES.

Experiments with Larvicides were conducted. The substances tried may be divided into two main groups—viz. (a) soluble, and (b) insoluble. The former mix with water, as in the case of Cyllin, Sanitas Okol, and Phinotas, while the latter do not, but form a film on the surface. This group includes Petrolite.

As a general rule soluble larvicides act best on larvæ, but insoluble ones are more effective for pupæ. The soluble oil acts as poison, but because the pupæ have no external masticating organs, they are liable to be resistant. In the case of the insoluble group, owing to the pupa's buoyancy it is more liable to suffocation than in its larval stage.

Petrolite, applied at the rate of half an ounce per yard, killed all pupæ in 22 minutes and about 90 per cent. of larvæ in 4 hours, the remainder dying during the night.

Phinotas diluted 1 in 5,662 killed larvæ of *C. fatigans* in 6 minutes, and all pupæ in 40 minutes.

The following tests were made with crude Cyllin and Sanitas Okol as larvicides:—

#### *Crude Cyllin.*

1 in 50 killed all larvæ of *C. fatigans* in 6 minutes, and all pupæ, except 1, in 22 minutes, the last being killed in 30 minutes.

1 in 100 killed 90 per cent. of larvæ in 6 minutes, and the remainder in 11 minutes. 30 per cent. of pupæ killed in 1 hour 20 minutes, and the remainder, except 1, in 3½ hours, the last being killed in 4 hours 10 minutes.

1 in 150 killed 80 per cent. of larvæ in 6 minutes, and the rest in 16 minutes. All pupæ, except 1, killed in 4 hours, the last still alive after 24 hours.

1 in 300 killed all larvæ in 15 minutes; all pupæ still alive after 24 hours.

1 in 600 killed 80 per cent. of larvæ in 20 minutes, and the rest in 30 minutes. All pupæ alive after 24 hours' exposure.

1 in 1,000 killed about 30 per cent. of larvæ in 4½ hours, about 10 per cent. of larvæ still alive after 24 hours; all pupæ alive after 24 hours' exposure. Several mosquitoes had hatched out.

1 in 2,000: About 5 per cent. of larvæ dead in 4½ hours, the remainder, with all pupæ, being alive after 24 hours. Several mosquitoes had hatched out.

1 in 2,500: Only few larvæ dead. Many mosquitoes had hatched out.

1 in 5,000 affected neither larvæ nor pupæ.

One part in 10,000 and 1 in 20,000, were also tried. Owing to its feeble action on larvæ, crude Cyllin is unsuitable as a larvicide; it would also be too expensive to use on a large scale.

#### *Sanitas Okol.*

1 in 600: All larvæ dead in 15 minutes, and all pupæ dead in 3 hours.

1 in 1,000 killed majority of larvæ in 15 minutes and the rest in 50 minutes; about 50 per cent. of pupæ died during the night, the remainder were not affected. Many mosquitoes had hatched out.

1 in 2,000: About 50 per cent. of larvæ dead in 15 minutes, the rest in 2½ hours. Pupæ not affected.

1 in 2,500 killed a few larvæ in 15 minutes, and the remainder, except 1, in 2½ hours, the last dying after 3 hours. No effect on pupæ.

Weaker solutions were tried up to 1 in 20,000; all of which had no effect on larvæ or pupæ.

#### *Petrolite.*

Petrolite's larvicidal power lies in the film formation. If there is a strong wind the oil will be washed on to the bank, and will become useless for the time being, but when the wind decreases and pressure is applied to the banks (as by walking on them) the oil is caused to ooze out again into the water. An experiment was tried with this oil on a gully measuring 5½ chains long by an average of 10 ft. wide.

On the first day a steady wind was blowing, thus driving all larvæ and pupæ towards one end. The same wind was blowing the following day, and on the third day the wind blew in the opposite direction.

One gallon of petrolite was applied at varying places between the two ends. The wind affected the formation of the film, but not to a great extent. Some of the oil was swept by the wind towards the banks at A.

The results with the larvicide are as follows:—

First day—

3.20 p.m., oil applied.

3.55, majority of pupæ dead.

4.10, all pupæ dead; no larvæ dead.

Second day—

10.20 a.m., all larvæ collected at opposite end!

No film between ends.

Third day—

10.30 a.m., almost all larvæ dead (only 3 hatched alive).

Film had extended all over waterhole.

When the wind changed the film was distributed more or less all over the surface. One gallon covered all the surface, which is at the rate of 9/22 (about ½) an ounce to the square yard.

I have, &c.,

L. E. COOLING, Acting Inspector.

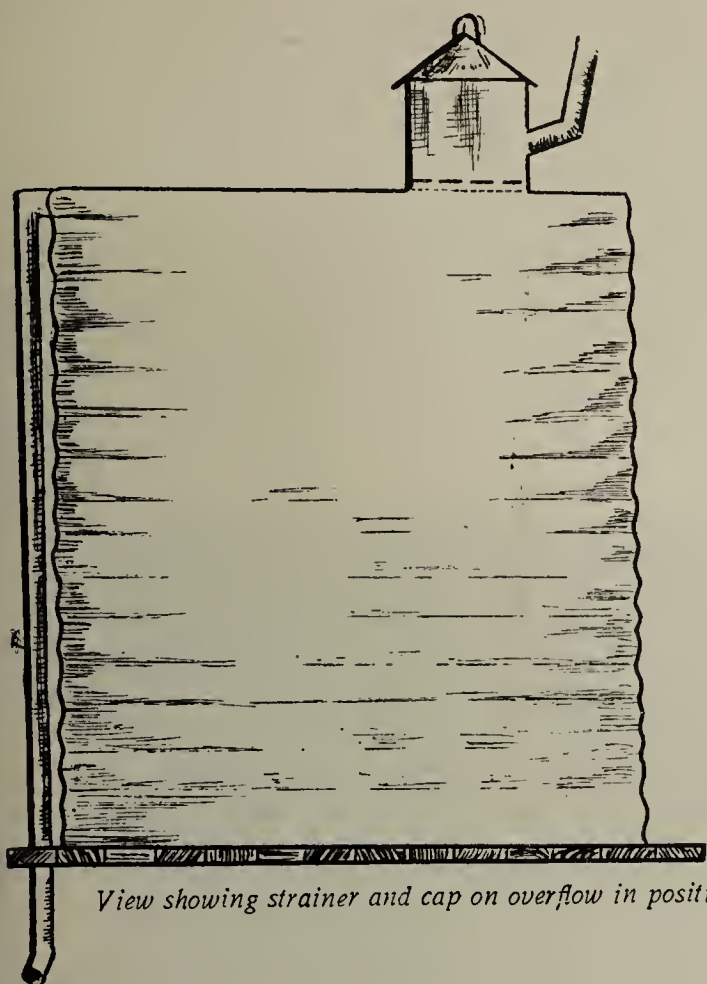
The Chief Inspector, Health Department.



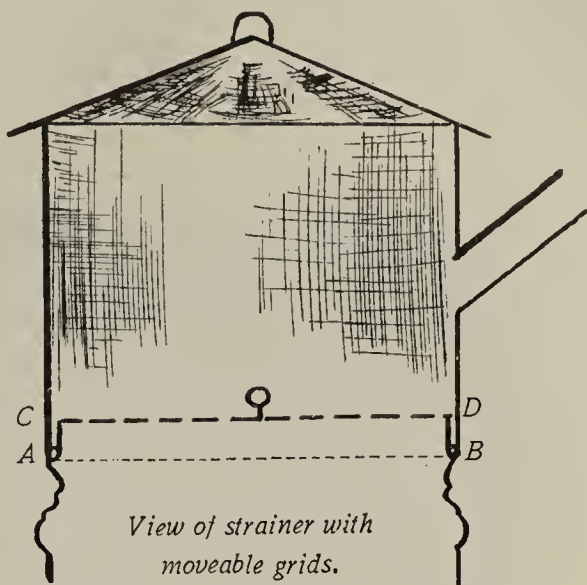
## SUMMARY OF OBSERVATIONS—MOSQUITO INQUIRY, BRISBANE, 1912.

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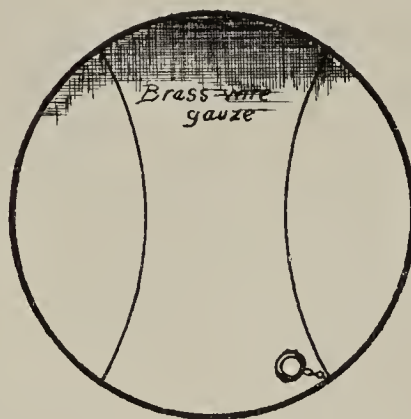




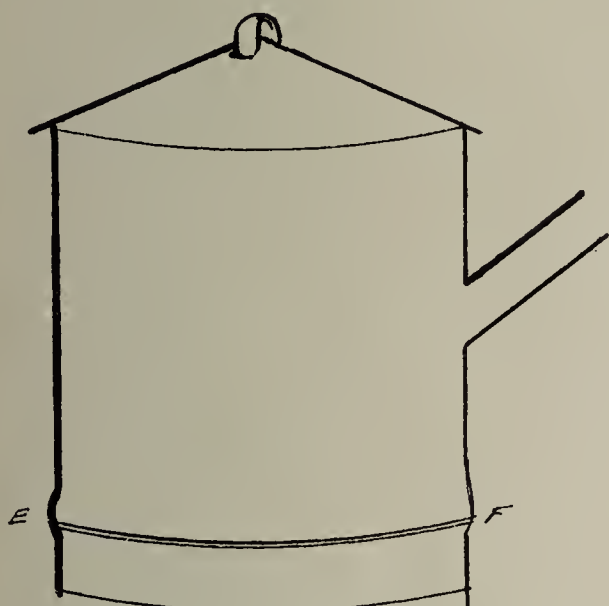
View showing strainer and cap on overflow in position.



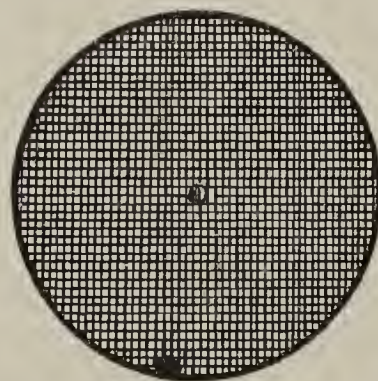
View of strainer with moveable grids.



Section at A.B. Brass wire gauze on iron frame.



Showing fixed wire gauze at E.F.

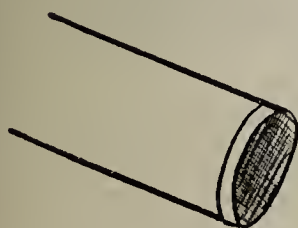


Section at C.D. Galvanised wire mesh.

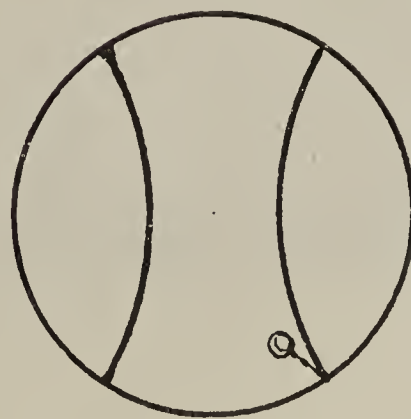
Alternative Cheaper Construction.  
Fig 2.



View of C.D.



Cap for end of overflow.



Galvanised wire ring and lift ready to receive brass gauze.







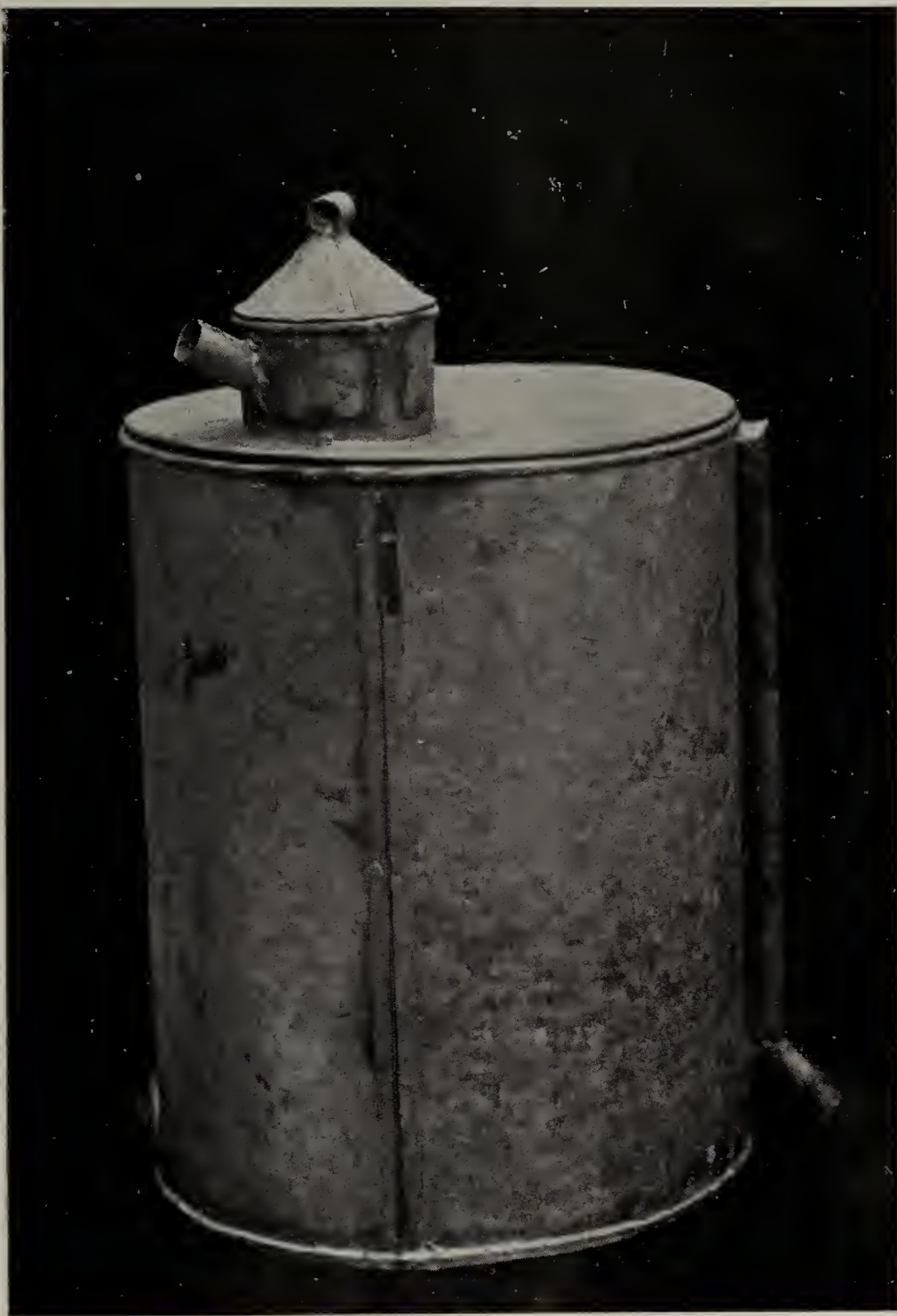


INTERNAL ARRANGEMENT OF MOSQUITO-PROOF STRAINER.









SHOWING METHOD OF AFFIXING STRAINER TO TANK.







SPECIFICATION OF MOSQUITO-PROOF RAIN WATER TANK STRAINERS.

The depth of strainers to be governed by the height between top of rain water tank and eaves gutter and to be of the relative dimensions shown in detailed sketches. A diameter of 12 inches in the body of the strainer is a convenient size.

The body of the strainer to be made of 24-gauge galvanised-iron of an approved brand, and neatly fitted to manhole on top of tank.

The strainer body to slip inside the tank for a distance of 1½ inch, having a flange soldered on, or swaged, to prevent its projecting to a greater depth.

Fit and provide two movable grids inside body of strainer. The lower grid to be made of strong brass or bronze or copper wire gauze of not less than twenty (20) meshes per lineal inch each way, and soldered to a No. 8 gauze galvanised-iron wire ring, the full diameter of the strainer body, and strengthened by two similar wires carried across the under-side of wire gauze, securely soldered in position in order to prevent sagging of the brass or bronze or copper gauze, and to fit neatly when fixed in position and supported on three or more lugs soldered in at the swaying in strainer body level with the top of the tank.

The top grid to be made of No. 14 gauze galvanised-iron wire netting of about ¾ or ½ an inch mesh, or of 24-gauge galvanised sheet iron, with holes of a similar size neatly punched in same, and soldered on to a rim of galvanised-iron not less than

1¼ inch deep, fitted neatly into body of strainer above lower grid for the purpose of preventing leaves, &c., collecting on top of wire gauze strainer. The moveable grids of strainers to be provided with one or more folding loop rings of galvanised-iron wire securely soldered on, for the purpose of removing same when required.

The inlet pipe from roof gutter to be made to discharge over the top grid, and securely fitted into strainer body.

All strainers to be fitted with conical lids of galvanised-iron and handles for removing same.

The shoe on the bottom end of overflow pipes of all rain water tanks to be fitted with a close-fitting brass gauze removable cap or shoe, of the same mesh as before specified for strainer.

The top edge of the overflow pipes of tanks fitted with mosquito-proof strainers to be kept at least 2 inches down from top of tank, and an aperture the full size of the overflow pipes cut out, and the pipe fitted thereto and securely soldered into position.

ALTERNATIVE.

Where cheaper work is required, the brass wire gauze may be soldered closely all round inside the strainer-body (as at EF, Figure 2), and the galvanised wire-netting omitted.

Department of Public Health, Queensland, 1912.

APPENDIX 8.

VISITS OUTSIDE METROPOLITAN AREA MADE BY INSPECTING STAFF.—1ST JULY, 1911, TO 30TH JUNE, 1912.

Date.	Place.	Inspector.	Purpose of Visit.
21 Mar., 1912	Allora .. ..	C. W. Beaver .. ..	Sanitary survey
12 June, 1912	Ayr .. ..	R. A. Wright .. ..	General inspection
16 Aug., 1911	Beenleigh .. ..	C. M. Cato .. ..	Milk sampling
3 Sept., 1911	Beenleigh .. ..	C. M. Cato .. ..	Laying information for milk prosecution
6 Sept., 1911	Beenleigh .. ..	C. M. Cato .. ..	Milk prosecution
20 Dec., 1911	Bundaberg .. ..	C. M. Cato .. ..	Bread weighing
21 Dec., 1911	Bundaberg .. ..	C. M. Cato .. ..	Milk sampling
26 Dec., 1911	Burleigh Heads.. ..	C. M. Cato .. ..	Inspection of camping resorts
26 Dec., 1911	Booringaba .. ..	C. M. Cato .. ..	Milk sampling
9 Feb., 1912	Bundaberg .. ..	C. M. Cato .. ..	Attending Police Court <i>re</i> milk prosecutions
11 Mar., 1912	Bowen .. ..	C. M. Cato .. ..	Sanitary survey
9 Jan., 1912	Blair Athol .. ..	C. M. Cato .. ..	Inquiry into typhoid fever outbreak
4-5 Aug., 1911	Bundaberg .. ..	C. W. Beaver .. ..	Inspection of sanitary dépôt, general inspection
23 Aug., 1911	Blackbutt .. ..	C. W. Beaver .. ..	Sanitary survey
4 Dec., 1911	Boonah .. ..	C. W. Beaver .. ..	Inquiry into typhoid fever outbreak
20 Dec., 1911	Bundaberg .. ..	C. W. Beaver .. ..	Milk sampling
6 Feb., 1912	Bundaberg .. ..	C. W. Beaver .. ..	Prosecution, milk adulteration
9 Feb., 1912	Bundaberg .. ..	C. W. Beaver .. ..	Prosecution, milk adulteration
10-12 Mar., 1912	Binjour Plateau .. ..	E. H. Burton .. ..	Enquiring into typhoid fever outbreak
6-9 Dec., 1911	Beaudesert .. ..	E. H. Burton .. ..	Sanitary survey
4 Mar., 1912	Beenleigh .. ..	Chief Inspector J. Simpson	Reinspection of main drainage
8 Apr., 1912	Burleigh Heads.. ..	Chief Inspector J. Simpson	Reinspection of summer camping grounds
22 June, 1912	Bundaberg .. ..	Chief Inspector J. Simpson	Inspecting sewers and new sanitary dépôt
12 June, 1912	Brandon .. ..	R. A. Wright .. ..	General inspection and school disinfection
8 Apr., 1912	Coolangatta .. ..	C. M. Cato .. ..	Reinspection of summer camping ground
8 Apr., 1912	Curumbin Creek .. ..	Chief Inspector J. Simpson	Inspection of summer camping grounds
23 Jan., 1912	Charleville .. ..	Chief Inspector J. Simpson	Sanitary inspection
17 Aug., 1911	Crow's Nest .. ..	S. Dudley .. ..	Bread weighing
3 Dec., 1911	Cloncurry .. ..	S. Dudley .. ..	Infectious diseases
3-4 Apr., 1912	Cloncurry .. ..	S. Dudley .. ..	Further enquiry into outbreak of infectious diseases
22 July, 1911	Chermside .. ..	S. Dudley .. ..	Inspection of piggeries
25 Dec., 1911	Coolangatta .. ..	C. M. Cato .. ..	Inspection of summer camping grounds



APPENDIX 8—*continued.*

VISITS OUTSIDE METROPOLITAN AREA MADE BY INSPECTING STAFF.—1ST JULY, 1911,  
TO 30TH JUNE, 1912.—*continued.*

Date.	Place.	Inspector.	Purpose of Visit.
11 Jan., 1912	Clermont .. ..	C. M. Cato .. ..	Sanitary survey
14 Feb., 1912	Charters Towers .. ..	C. M. Cato .. ..	Sanitary survey
14 Nov., 1911	Coolangatta .. ..	E. H. Burton .. ..	Inspecting pig saleyards and railway pig trucks
1-3 Apr., 1912	Canungra .. ..	E. H. Burton .. ..	Inspection of proposed new sanitary depôt
20 May, 1912	Corinda .. ..	E. H. Burton .. ..	Enquiry into typhoid fever outbreaks
10-14 Aug., 1911	Dalby .. ..	S. Dudley .. ..	Bread weighing and milk sampling
19 Sept., 1911	Dalby .. ..	S. Dudley .. ..	Food prosecutions
4 Mar., 1912	Eton .. ..	C. M. Cato .. ..	Sanitary survey
4-13 Dec., 1911	Friezland .. ..	S. Dudley .. ..	Enquiring typhoid fever outbreak
19 July, 1911	Forest Hill .. ..	C. M. Cato .. ..	Bread weighing
1 Mar., 1912	Finch Hatton .. ..	C. M. Cato .. ..	Sanitary survey
18 July, 1911	Gatton .. ..	C. M. Cato .. ..	Bread weighing
21 July, 1911	Glamorgan Vale .. ..	C. M. Cato .. ..	Bread weighing
9 Mar., 1912	Gayndah .. ..	E. H. Burton .. ..	Sanitary survey
4 Dec., 1911	Gayndah .. ..	C. M. Cato .. ..	Sanitary survey
17-20 Apr., 1912	Greenmount and District	E. H. Burton .. ..	Enquiry diphtheria outbreak
13-15 May, 1912	Gympie .. ..	E. H. Burton .. ..	Drainage inspection
11 May, 1912	Greenmount and Darling Downs	C. W. Beaver .. ..	Disinfection State school
27-28 Feb., 1912	Halifax .. ..	S. Dudley .. ..	Sanitary survey
10 Aug., 1911	Howard .. ..	C. W. Beaver .. ..	Sanitary survey
26 Oct., 1911	Ipswich .. ..	E. H. Burton .. ..	Bread weighing
10 Nov., 1911	Ipswich .. ..	Chief Inspector J. Simpson	Making arrangements for taking samples of milk
4 Jan., 1912	Ipswich .. ..	Chief Inspector J. Simpson	Milk prosecutions
27 Apr., 1912	Inglewood .. ..	Chief Inspector J. Simpson	Milk sampling
12 Nov., 1911	Ipswich .. ..	C. M. Cato .. ..	Milk sampling
28 Dec., 1911	Ipswich .. ..	C. M. Cato .. ..	Laying information <i>re</i> milk prosecution
4 Jan., 1912	Ipswich .. ..	C. M. Cato .. ..	Milk prosecutions
24 Oct., 1911	Ipswich .. ..	C. W. Beaver .. ..	Milk sampling
12 Nov., 1911	Ipswich .. ..	C. W. Beaver .. ..	Milk sampling
29 Apr., 1912	Inglewood .. ..	E. H. Burton .. ..	Milk sampling
21 Nov., 1911	Ipswich .. ..	C. W. Beaver .. ..	Milk prosecutions
27 Nov., 1911	Ipswich .. ..	C. W. Beaver .. ..	Milk prosecutions
28 Dec., 1911	Ipswich .. ..	C. W. Beaver .. ..	Milk prosecutions
4 Jan., 1912	Ipswich .. ..	C. W. Beaver .. ..	Milk prosecutions
21-22 Sept., 1911	Inglewood .. ..	S. Dudley .. ..	Enquiry infectious disease and sanitary service
25-26 Oct., 1911	Ipswich .. ..	S. Dudley .. ..	Food inspection
12 Nov., 1911	Ipswich .. ..	S. Dudley .. ..	Milk sampling
21-22 Feb., 1912	Innisfail .. ..	S. Dudley .. ..	Sanitary survey
23-26 Feb., 1912	Ingham .. ..	S. Dudley .. ..	Sanitary survey
26 Apr., 1912	Killarney .. ..	E. H. Burton .. ..	Sanitary reinspection
1 Dec., 1911	Kingston .. ..	E. H. Burton .. ..	Mosquito survey and inspection of district
26 Apr., 1912	Killarney .. ..	Chief Inspector J. Simpson	Inspection of proposed sanitary depôt
28 Apr., 1912	Laidley .. ..	C. W. Beaver .. ..	Milk sampling
8 May, 1912	Laidley .. ..	C. W. Beaver .. ..	Milk prosecutions
28 May, 1912	Laidley .. ..	C. W. Beaver .. ..	Milk prosecutions
27-28 Feb., 1912	Laidley .. ..	E. H. Burton .. ..	Milk sampling
28 May, 1912	Laidley .. ..	E. H. Burton .. ..	Milk prosecutions
20 July, 1911	Laidley .. ..	C. M. Cato .. ..	Bread weighing
19 Aug., 1911	Laidley .. ..	C. M. Cato .. ..	Laying information, light-weight bread prosecution
30 Aug., 1911	Laidley .. ..	C. M. Cato .. ..	Prosecutions for light-weight bread
14-17 Dec., 1911	Malbon Railway Camp	S. Dudley .. ..	Enquiry typhoid fever outbreak
5-12 Apr., 1912	Malbon Railway Camp	S. Dudley .. ..	Reinspection and initiation of sanitary service
21 July, 1911	Marburg .. ..	C. M. Cato .. ..	Bread weighing
29 Oct., 1911	Mount Morgan .. ..	C. M. Cato .. ..	Milk sampling and bread weighing
9 Dec., 1911	Miriam Vale .. ..	C. M. Cato .. ..	Disinfection of house vacated by leper
10 Dec., 1911	Mount Morgan .. ..	C. M. Cato .. ..	Bread weighing, information <i>re</i> milk prosecution
14 Dec., 1911	Mount Morgan .. ..	C. M. Cato .. ..	Milk prosecutions
26 Feb., 1912	Mackay .. ..	C. M. Cato .. ..	Sanitary survey
2 Mar., 1912	Mirani .. ..	C. M. Cato .. ..	Sanitary survey
17 Jan., 1912	Morven .. ..	C. M. Cato .. ..	Enquiry, typhoid fever outbreak
29 Jan., 1912	Morven .. ..	Chief Inspector J. Simpson	Reinspection sanitary circumstances of town
11 June, 1912	Mossman .. ..	S. B. Cottle .. ..	Sanitary survey and school disinfection
30 Jan., 1912	Mitchell .. ..	Chief Inspector J. Simpson	Inspection and selection of sanitary depôt
7 Aug., 1911	Many Peaks .. ..	C. W. Beaver .. ..	Sanitary survey
11 Aug., 1911	Maryborough .. ..	C. W. Beaver .. ..	Sanitary survey
25 Aug., 1911	Moore .. ..	C. W. Beaver .. ..	Inspector of slaughter-yards
29 Oct., 1911	Mount Morgan .. ..	C. W. Beaver .. ..	Milk sampling
30 Oct., 1911	Mount Morgan .. ..	C. W. Beaver .. ..	Bread weighing
9 Dec., 1911	Miriam Vale .. ..	C. W. Beaver .. ..	Disinfection of house vacated by leper
10 Dec., 1911	Mount Morgan .. ..	C. W. Beaver .. ..	Bread weighing
14 Dec., 1911	Mount Morgan .. ..	C. W. Beaver .. ..	Milk prosecutions
12 Jan., 1912	Mount Morgan .. ..	C. W. Beaver .. ..	Light-weight bread prosecutions
29 Dec., 1911	Nudgee .. ..	E. H. Burton .. ..	Inspection of seaside camps
15 Aug., 1911	Oakey .. ..	S. Dudley .. ..	Infectious diseases enquiry
11 Apr., 1912	Peel Island .. ..	E. H. Burton .. ..	Sanitary inspection of lazaret



## APPENDIX 8—continued.

VISITS OUTSIDE METROPOLITAN AREA MADE BY INSPECTING STAFF.—1ST JULY, 1911,  
TO 30TH JUNE, 1912.—continued.

Date.	Place.	Inspector.	Purpose of Visit.
14 Mar., 1912	Proserpine .. ..	C. M. Cato .. ..	Sanitary survey
14 Feb., 1912	Port Douglas .. ..	S. Dudley .. ..	General sanitary inspection
13 June, 1912	Port Douglas .. ..	S. B. Cottle .. ..	Special enquiry diphtheria and sanitary survey
30 Apr. to	Peel Island .. ..	S. Dudley .. ..	Inspection at lazaret
30 May, 1912	Peel Island .. ..	Nurse A. Perry .. ..	Inspection at lazaret
21 June, 1912	Pialba .. ..	Chief Inspector J. Simpson	Inspection public latrine, sea beach
16 Feb., 1912	Queenton .. ..	C. M. Cato .. ..	Sanitary survey
20 July, 1911	Rosewood .. ..	C. M. Cato .. ..	Bread weighing
31 Oct., 1911	Rockhampton .. ..	C. M. Cato .. ..	Milk sampling and bread weighing
12 Dec., 1911	Rockhampton .. ..	C. M. Cato .. ..	Laying information <i>re</i> milk prosecutions
18 Dec., 1911	Rockhampton .. ..	C. M. Cato .. ..	Milk prosecutions
20 Feb., 1912	Ravenswood .. ..	C. M. Cato .. ..	Sanitary survey
31 Oct., 1911	Rockhampton .. ..	C. W. Beaver .. ..	Milk sampling
1 Nov., 1911	Rockhampton .. ..	C. W. Beaver .. ..	Bread weighing
12 Dec., 1911	Rockhampton .. ..	C. W. Beaver .. ..	General food inspection (stores)
18 Dec., 1911	Rockhampton .. ..	C. W. Beaver .. ..	Milk prosecutions
9 Jan., 1912	Rockhampton .. ..	C. W. Beaver .. ..	Milk prosecutions
8 Jan., 1912	Rosewood .. ..	Chief Inspector J. Simpson	Inspection of main drain of township
3-14 May, 1912	Rockhampton .. ..	Chief Inspector J. Simpson	Enquiry typhoid fever outbreak
6 June, 1912	Salisbury .. ..	E. H. Burton .. ..	Inspection of slaughteryards and surrounding district
18-19 Dec., 1911	Selwyn .. ..	S. Dudley .. ..	Enquiry typhoid fever outbreak
20-21 Dec., 1911	Sandgate .. ..	E. H. Burton .. ..	Milk sampling and mosquito survey
1 Feb., 1912	Sandgate .. ..	E. H. Burton .. ..	Milk prosecutions
24 Dec., 1912	Tweed Heads .. ..	C. M. Cato .. ..	Inspection seaside camps
25 Apr. to	Torres Straits Islands ..	C. M. Cato .. ..	Sanitary inspection of islands, and vaccination of natives
20 May, 1912			
23 Apr., 1911	Thursday Island .. ..	C. M. Cato .. ..	Sanitary survey
9 May, 1912	Toowoomba .. ..	C. W. Beaver .. ..	Infectious disease enquiry
21 June, 1912	Toowoomba .. ..	C. W. Beaver .. ..	Inspection of sanitary site
7 Apr., 1912	Tweed Heads .. ..	Chief Inspector J. Simpson	Inspection of seaside camps
20 May, 1912	Toowoomba .. ..	Chief Inspector J. Simpson	Inspection and selection of sanitary depôt
13-31 Jan., 1912	Townsville .. ..	E. H. Burton .. ..	On duty, Northern Office
18 Apr. to	Townsville .. ..	S. B. Cottle, R. A. Wright, J. Wiseman	Sanitary survey, mosquitoes, and general inspection
30 June, 1912			
24-29 Sept., 1911	Toowoomba .. ..	S. Dudley .. ..	Sanitary survey
23-25 Oct., 1911	Toowoomba .. ..	S. Dudley .. ..	General food inspection
17 Jan. to	Townsville .. ..	S. Dudley .. ..	On duty, Northern Office
12 April, 1912			
6-15 May, 1912	Thuringowa, Townsville, Magnetic Island	R. A. Wright .. ..	Sanitary survey
14 May, 1912	Townsville, Stewart's Ck.	S. B. Cottle .. ..	Sanitary survey
2 Mar., 1912	Walkerston .. ..	C. W. Cato .. ..	Sanitary survey
8 Mar., 1912	Woothakata .. ..	S. Dudley .. ..	Special enquiry typhoid fever outbreak

## APPENDIX 9.

A.—NUMBER OF RATS AND MICE CAUGHT OR COLLECTED AND EXAMINED, BRISBANE METROPOLITAN AREA,  
1ST JULY, 1911, TO 30TH JUNE, 1912.

Month.	DESTROYED.			SUBMITTED FOR EXAMINATION.			SPECIES.		
	Rats.	Mice.	Total.	Rats.	Mice.	Total.	*M.D.	*M.R.	*M.A.R.
July ... ..	2,514	276	2,790	2,257	273	2,530	875	92	169
August ... ..	2,503	174	2,677	2,190	174	2,364	882	79	181 also 1 water rat
September ... ..	2,015	183	2,198	1,634	177	1,811	799	69	130
October ... ..	4,338	152	4,490	2,827	148	2,975	1,030	175	82
November ... ..	3,797	144	3,941	2,971	137	3,108	884	48	194 „ 1 „ „
December ... ..	2,250	58	2,308	1,275	55	1,330	466	24	88
January ... ..	2,749	126	2,875	1,891	116	2,007	814	78	140 „ 2 „ „
February ... ..	2,630	134	2,764	1,805	128	1,933	675	40	157
March ... ..	3,258	185	3,443	2,101	181	2,282	791	221	68 „ 1 „ „
April ... ..	2,462	143	2,605	1,662	120	1,782	623	214	49
May ... ..	3,255	273	3,528	2,303	232	2,535	867	242	67
June ... ..	2,604	182	2,786	1,787	178	1,965	834	215	39
GRAND TOTAL ...	34,375	2,030	36,405	24,703	1,919	26,622	9,540	1,497	1,364

\* Mus decumanus, Mus rattus, and Mus alexandrinus rufus, respectively.

Date on which last infected rat from area was examined, 15th September, 1908.

Number of poisoned baits laid for year, 616,160.

Number of complaints of rat infestation receiving attention, 744.

## APPENDIX 9—continued.

B.—NUMBER OF RATS AND MICE CAUGHT OR COLLECTED AND EXAMINED BY DEPARTMENT'S STAFF  
AT OUT PORTS, 1ST JULY, 1911, TO 30TH JUNE, 1912.

1911-12.	DESTROYED.			EXAMINED.		
	Rats.	Mice.	Total.	Rats.	Mice.	Total.
MARYBOROUGH.						
July ... ..	418	130	548	415	130	545
August ... ..	473	113	586	473	113	586
September ... ..	503	40	543	500	40	540
October ... ..	453	49	502	453	49	502
November ... ..	426	41	467	426	41	467
December ... ..	276	35	311	266	35	301
January ... ..	422	26	448	422	26	448
February ... ..	409	76	485	409	76	485
March ... ..	367	98	465	367	98	465
April ... ..	407	76	483	407	76	483
May ... ..	446	59	505	446	59	505
June ... ..	346	84	430	346	84	430
TOTALS ... ..	4,946	827	5,773	4,930	827	5,757
BUNDABERG.						
July ... ..	347	7	354	63	3	66
August ... ..	388	26	414	81	1	82
September ... ..	375	14	389	88	4	92
October ... ..	354	6	360	45	2	47
November ... ..	454	34	488	101	7	108
December ... ..	436	30	466	32	...	32
January ... ..	466	29	495	82	...	82
February ... ..	440	85	525	78	4	82
March ... ..	438	72	510	48	2	50
April ... ..	393	47	440	75	2	77
May ... ..	355	61	416	67	2	69
June ... ..	481	61	542	72	...	72
TOTALS ... ..	4,927	472	5,399	832	27	859
ROCKHAMPTON.						
July ... ..	421	43	464	421	43	464
August ... ..	467	30	497	467	30	497
September ... ..	443	29	472	443	29	472
October ... ..	502	82	584	502	82	584
November ... ..	587	83	670	587	83	670
December ... ..	366	18	384	366	18	384
January ... ..	440	61	501	440	61	501
February ... ..	380	34	414	380	34	414
March ... ..	386	12	398	336	12	398
April ... ..	341	47	388	341	47	388
May ... ..	391	56	447	391	56	447
June ... ..	434	61	495	434	61	495
TOTALS ... ..	5,158	556	5,714	5,158	556	5,714
MACKAY.						
July ... ..	349	51	400	...	...	...
August ... ..	284	59	343	...	...	...
September ... ..	371	36	407	...	...	...
October ... ..	316	11	327	...	...	...
November ... ..	285	20	305	...	...	...
December ... ..	263	17	280	...	...	...
January ... ..	261	31	292	...	...	...
February ... ..	382	40	422	...	...	...
March ... ..	258	28	286	...	...	...
April ... ..	271	33	304	...	...	...
May ... ..	293	48	341	...	...	...
June ... ..	223	42	265	...	...	...
TOTALS ... ..	3,556	416	3,972	...	...	...
TOWNSVILLE.						
July ... ..	427	27	454	204	20	224
August ... ..	443	39	482	183	23	206
September ... ..	449	64	513	213	31	244
October ... ..	483	50	533	243	26	269
November ... ..	431	37	468	203	15	218
December ... ..	431	24	455	198	20	218
January ... ..	411	26	437	181	12	193
February ... ..	167	3	170	30	...	30
March ... ..	312	11	323	298	11	309
April ... ..	417	34	451	392	16	408
May ... ..	473	35	508	391	24	415
June ... ..	296	15	311	205	...	205
TOTALS ... ..	4,740	365	5,105	2,741	198	2,939



## APPENDIX 9—continued.

## C.—“THE HEALTH ACTS, 1900 TO 1911.”—NOXIOUS VERMIN (RATS).

## ORDER IN COUNCIL

At the Executive Council Chamber, Brisbane, the sixteenth day of May, 1912.

Present:

The Vice-President of the Executive Council.

WHEREAS it is provided by “*The Health Acts, 1900 to 1911*,” that the Governor in Council whenever he is satisfied that a visitation of any epidemic, endemic, or infectious disease may be prevented, or that the spread or continuance of any such disease may be checked, diminished, or prevented, by taking measures for the destruction of rats, may, by Order in Council, published in the *Gazette* and in such newspapers as the Commissioner directs, declare rats to be noxious vermin; and direct that owners and occupiers of all or any premises shall adopt such measures as are prescribed in the Order for the purpose of destroying such vermin and preventing their breeding and preventing their access to such premises, and destroying, removing, and preventing the accumulation of any articles, matters, or things which provide or are likely to provide harbourage or food for the same upon such premises: Now, therefore, the Vice-President of the Executive Council, by and with the advice of the Executive Council, and in pursuance of the provisions of the said Acts, doth hereby declare and order—

- (1.) That rats are noxious vermin;
- (2.) That the following measures shall be adopted by the owners and occupiers of all premises within the metropolitan area—that is to say, the Cities of Brisbane and South Brisbane, the Towns of Hamilton, Ithaca, Toowong, Windsor, the Shire of Stephens, and so much of the Shire of Balmoral as lies to the west of Bulimba Creek.

1.—No owner or occupier shall place, throw, leave, or suffer to remain on his premises any waste food, refuse, garbage, waste matter, or thing which would have a tendency to encourage or attract rats to visit or frequent such premises or to form or afford harbourage or shelter to rats.

2.—Whenever upon any premises any litter, hay, straw, packing material, manure, building material, produce, timber, bags, tins, old iron, paper, packing cases, or similar material is kept or stored in such a way as to afford or form shelter or harbourage for rats, it shall be removed or so stacked, stored, arranged, or protected as to no longer afford or form shelter or harbourage for rats.

3.—No waste food, garbage, edible trade waste, horsefeed or cowfeed (except hay), food intended for birds or other animals, or similar material, shall be kept or allowed to remain on any premises unless it is contained in rat-proof receptacles or compartments which are kept effectively covered or closed against access by rats.

4.—Every opening from or into any covered drain or sewer within the curtilage of any premises, and every opening from or into any pipe, covered conduit, or covered channel (whether or not used for drainage) which affords or is likely to afford access, shelter, or harbourage for rats, shall be so trapped or otherwise protected as to prevent effectively the ingress or egress of rats.

5.—Every disused covered drain, disused covered sewer, disused pipe, disused covered conduit, or disused covered channel within the curtilage of any premises which affords or is likely to afford access, harbourage, or shelter for rats shall, upon notice to that effect being given by the Commissioner to the owner or occupier of the premises, be taken up, repaired, blocked, or otherwise so dealt with in the manner specified in such notice as to effectively prevent the access, harbourage, or shelter of rats therein.

6.—Whenever in any building the floors, skirtings, wainscots, walls, partitions, ceilings, or like internal fittings, or any of these, are so constructed or are in such a condition as to permit the access, shelter, or harbouring of rats in, under, or about such building, the said floors, skirtings, wainscots, walls, partitions, ceilings, or like internal fittings, shall be so removed, refitted, reconstructed, altered, or repaired as to prevent as far as practicable the access, shelter, or harbouring of rats in, under, or about such building.

7.—Every retaining wall, embankment, or similar structure, within the curtilage of any premises, which is constructed or faced with loose stones, rubble, slabs, or similar material, and which affords or is likely to afford harbourage or shelter for rats, shall be so protected, reconstructed, repaired, or altered as to effectively prevent rats from harbouring or sheltering therein.

8.—Every hotel, restaurant, butcher's shop, smallgoods shop, baker's shop, grocer's shop, fruit shop, fish shop, oyster saloon, produce store, hide store, flour mill, stable, and slaughter-house shall be so protected, altered, or refitted in accordance with inspector's orders as to effectively prevent rats from gaining access to or harbouring in, under, or about the building or buildings thereof. All holes or openings in the external walls of such buildings which are of such a nature as to permit the entry of rats shall be blocked with cement or protected with stout wire netting or metal in such a manner as to effectively prevent the entry of rats.

9.—For every hotel, restaurant, butcher's shop, smallgoods shop, baker's shop, grocer's shop, fruit shop, fish shop, oyster saloon, produce store, hide store, flour mill, stable, and slaughter-house there shall be provided at least two rat-traps of a pattern approved by the Commissioner, or as many more as may be required from time to time by the Commissioner. Every such trap shall be baited with fresh bait at least twice in each week, and shall be kept set. Every such trap shall be inspected daily by the owner or occupier or his agent or servant, and all rats found therein shall be killed and their carcasses forthwith disposed of so as not to cause a nuisance, and the trap or traps reset and rebaited by the said owner or occupier or his agent or servant.

10.—In addition to the foregoing, every owner and occupier shall use all reasonable means by blocking access ways, destroying harbourage, protecting foodstuffs, poisoning, trapping, the use of rat-killing dogs, cats, or other animals, and otherwise to keep the premises occupied by him free from rats and to prevent and discourage the access to or harbouring of rats in, on, or about such premises.

And the Honourable the Home Secretary is to give the necessary directions herein accordingly.

E. H. ABELL, Clerk of the Council.



APPENDIX 10.

FOODSTUFFS CONDEMNED AND DESTROYED AS UNFIT FOR HUMAN CONSUMPTION FOR YEAR ENDING  
30TH JUNE, 1912.

A.—METROPOLITAN AREA.

Article.	Quantity.	Weight.			
		Tons	cwt.	qr.	lb.
Potatoes .. .. .	649 bags	64	18	2	0
Mangoes .. .. .	51 cases	0	18	0	24
Oysters .. .. .	8 bags	0	16	0	0
Hams .. .. .	25 "	0	2	0	0
Turnips .. .. .	22 "	1	6	2	0
Pawpaws .. .. .	80 cases	1	10	0	0
Oranges .. .. .	14 "	0	6	0	28
Cherries .. .. .	10 "	0	1	1	1
Pears .. .. .	13 bushels	0	3	2	16
Salt Herrings .. .. .	400 barrells	24	10	0	0
Onions .. .. .	3 bags	0	4	0	0
Walnuts (shelled) .. .. .	4 cases	0	4	0	0
Lemons .. .. .	5 "	0	1	1	10
Figs (Turkey) .. .. .	730 boxes	9	1	2	10
Apples .. .. .	3 <sup>3</sup> / <sub>4</sub> cases	0	1	3	18
Plums .. .. .	1 case	0	0	2	4
Preserved Pears, &c. .. .. .	10 tins	0	0	0	20
Cheese .. .. .	2 cases	0	3	0	0
Sardines .. .. .	64 tins	0	0	2	2
Jam .. .. .	432 "	0	7	2	18
Mullet .. .. .	1 "	0	0	0	1
Crab Japanese .. .. .	1 "	0	0	0	1
Herrings (various) .. .. .	8 "	0	0	0	8
Luncheon Beef .. .. .	2 "	0	0	0	4
Condensed Milk .. .. .	4 "	0	0	0	4
Salmon .. .. .	6 "	0	0	0	6
Limes .. .. .	1 bag	0	0	0	20
Chinese Vinegar .. .. .	1 jar	0	0	0	20
Cakes and Plum Pudding .. .. .	6 parcels	...	...	...	...
Crayfish .. .. .	1 case	0	3	2	0
10 Crates of Bananas .. .. .	...	3	0	0	0
TOTAL .. .. .	...	108	1	0	19

B.—COUNTRY.

Sardines .. .. .	34 tins	0	0	0	15
Jams .. .. .	243 "	0	3	0	25
Fish (canned) .. .. .	76 "	0	0	1	22
Preserves .. .. .	85 "	0	1	2	2
Cheese .. .. .	2 "	0	0	0	1
Plums .. .. .	13 cases	0	3	1	0
TOTAL .. .. .	...	0	8	2	9

C.—TOWNSVILLE.

FROM 1ST JANUARY, 1912, TO 30TH JUNE, 1912.

Tinned Foods—															
Baked Beans	...	...	...	...	...	...	...	...	4	tins	0	0	0	6	
Coffee and Milk	...	...	...	...	...	...	...	...	1	"	0	0	0	1	
Fruits	...	...	...	...	...	...	...	...	48	"	0	0	3	12	
Fish	...	...	...	...	...	...	...	...	1,174	"	0	9	3	27 $\frac{1}{4}$	
Jam	...	...	...	...	...	...	...	...	295	"	0	4	0	18	
Meat	...	...	...	...	...	...	...	...	32	"	0	0	1	12	
Milk	...	...	...	...	...	...	...	...	16	"	0	0	0	16	
Mutton Broth	...	...	...	...	...	...	...	...	1	"	0	0	0	1	
Ox Tongues	...	...	...	...	...	...	...	...	3	"	0	0	0	5 $\frac{1}{2}$	
Peas	...	...	...	...	...	...	...	...	2	"	0	0	0	2	
Pickles	...	...	...	...	...	...	...	...	1	bottle	0	0	0	1	
Potted Fish and Meats	...	...	...	...	...	...	...	...	56	tins	0	0	1	0	
Sheep Tongues	...	...	...	...	...	...	...	...	1	"	0	0	0	1	
Tomato Sauce	...	...	...	...	...	...	...	...	2	bottles	0	0	0	2	
Bulk Foods and Lose Foods—															
Cabbages	...	...	...	...	...	...	...	...	3	crates	0	27	0	0	
Cocoa	...	...	...	...	...	...	...	...	200	tins	0	0	1	22	
Currants	...	...	...	...	...	...	...	...	$\frac{1}{4}$	case	0	0	0	14	
Dates	...	...	...	...	...	...	...	...	216	packets	0	1	3	20	
Herrings	...	...	...	...	...	...	...	...	1	box	0	0	0	14	
Maccaroni	...	...	...	...	...	...	...	...	24	packets	0	0	0	24	
Potatoes	...	...	...	...	...	...	...	...	140	bags	14	0	0	0	
Rolled Oats	...	...	...	...	...	...	...	...	3	tins	0	0	0	6	
Plums	...	...	...	...	...	...	...	...	31	cases	0	6	3	4	
TOTAL										...		16	12	2	12 $\frac{3}{4}$



APPENDIX 11.

PROSECUTIONS FOR MILK ADULTERATION, FROM 1ST JULY, 1911, TO 30TH JUNE, 1912.

No.	Date.	Place.	Basis of Prosecutions.	Fines.			Costs.		
				£	s.	d.	£	s.	d.
1	18 July, 1911 ...	Brisbane...	15·8 per cent. added water ...	4	10	0	0	15	8
2	" " ...	Ditto ...	32·4 " " " ...	10	0	0	2	10	6
3	23 January, 1912...	Ditto ...	23·9 " " " ...	20	0	0	0	5	0
4	6 November, 1911	Ditto ...	10·2 " " " ...	15	0	0	0	5	4
5	29 August, 1911 ...	Ditto ...	4·2 " " " ...	10	0	0	2	5	6
6	6 November, 1911	Ditto ...	17·3 " " " ...	12	9	6	2	10	6
7	" " ...	Ditto ...	7·5 " " " ...	6	6	0	0	10	4
8	" " ...	Ditto ...	3·6 " " " ...	3	3	0	2	12	4
9	18 July, 1911 ...	Ditto ...	15·3 " " " ...	5	0	0	0	3	6
10	12 September, 1911	Ditto ...	5·7 " " " ...	5	0	0	2	5	6
11	6 November, 1911	Ditto ...	30·0 per cent. deficient in butter-fat	2	2	0	2	12	4
12	" " ...	Ditto ...	6·8 per cent. added water ...	5	5	0	0	10	4
13	29 August, 1911 ...	Ditto ...	6·6 " " " ...	10	0	0	2	5	6
14	16 October, 1911...	Ditto ...	22·6 " " " ...	15	0	0	0	3	6
15	6 November, 1911	Ditto ...	1·8 per cent. added water and 4·7 per cent. deficient butter-fat	2	2	0	1	11	4
16	" " ...	Ditto ...	2·4 per cent. added water ...	3	3	0	2	12	4
17	" " ...	Ditto ...	13·6 " " " ...	10	0	0	2	12	4
18	25 June, 1911 ...	Ditto ...	Adulteration ...	10	0	0	...		
19	" " ...	Ditto ...	" " " ...	10	0	0	...		
20	6 September, 1911	Beenleigh ...	21·2 per cent. added water ...	5	0	0	0	3	6
21	18 December, 1911	Bundaberg ...	7·3 " " " ...	3	0	0	1	5	4
22	" " ...	Ditto ...	4·8 " " " ...	3	0	0	1	19	4
23	" " ...	Ditto ...	7·7 " " " ...	3	0	0	1	10	4
24	" " ...	Ditto ...	5·3 " " " ...	3	0	0	1	10	4
25	" " ...	Ditto ...	4·0 " " " ...	3	0	0	2	12	4
26	4 January, 1912...	Ipswich ...	4·6 " " " ...	5	0	0	2	14	4
27	" " ...	Ditto ...	5·0 " " " ...	7	0	0	0	3	6
28	27 November, 1911	Ditto ...	5·0 " " " ...	5	0	0	2	12	4
29	" " ...	Dit o ...	Refusal to sell ...	2	0	0	2	5	6
30	28 August, 1912 ...	Laidley ...	" " " ...	0	5	0	2	5	6
31	" " ...	Ditto ...	" " " ...	2	0	0	2	5	6
32	14 December, 1911	Mount Morgan ...	25·5 per cent. added water ...	20	0	0	2	3	5
33	" " ...	Ditto ...	8·3 " " " ...	8	6	0	2	13	11
34	" " ...	Ditto ...	7·2 " " " ...	7	4	0	2	3	5
35	" " ...	Ditto ...	11·8 " " " ...	11	16	0	2	3	5
36	18 Deeember, 1911	Roekhampton ...	10·2 " " " ...	10	4	0	2	14	0
37	" " ...	Ditto ...	6·0 " " " ...	6	0	0	2	9	4
38	" " ...	Ditto ...	7·9 " " " ...	7	18	0	2	14	4
39	" " ...	Ditto ...	17·7 " " " ...	17	14	0	2	8	8
40	" " ...	Ditto ...	3·0 " " " ...	3	0	0	2	14	0
41	" " ...	Ditto ...	9·5 " " " ...	9	10	0	2	14	4
42	" " ...	Ditto ...	16·2 " " " ...	16	4	0	2	14	0
43	" " ...	Ditto ...	6·6 " " " ...	6	12	0	2	9	4
44	" " ...	Ditto ...	7·7 " " " ...	7	14	0	2	9	0
45	1 February, 1912	Sandgate ...	10·8 " " " ...	10	0	0	0	3	6
46	" " ...	Ditto ...	3·5 " " " ...	5	0	0	0	3	6
				£347	7	6	£80	17	6
Total Fines and Costs ...				£428			5 0		

APPENDIX 12.

PROSECUTIONS FOR LIGHT-WEIGHT BREAD, 1ST JULY, 1911, TO 30TH JUNE, 1912.

No.	Date.	Place.	Fine.	Costs.		
				£	s.	d.
1	12 January, 1912 ...	Mount Morgan ...	1 18 9	2	5	6
2	20 September, 1912 ...	Dalby ...	0 10 0	1	4	6
3	30 August, 1911 ...	Laidley ...	2 1 0	0	3	6
4	" " ...	Ditto ...	0 8 6	2	5	6
5	" " ...	Ditto ...	0 14 7	2	5	6
6	" " ...	Ditto ...	0 13 10	2	5	6
7	9 February, 1912 ...	Bundaberg ...	3 16 8	1	10	4
			£10 3 4	£12	0	4
TOTAL ...			£22	3	8	



APPENDIX 13.

PROSECUTIONS FOR SPITTING ON FOOTPATHS, FROM 1ST JULY, 1911, TO 30TH JUNE, 1912.

No.	Place.				Result.			Fine.			Total Fine and Costs.		
								£	s.	d.	£	s.	d.
1	Brisbane North	...	...	...	Convicted	...	...	2	0	0	2	3	6
2	Ditto	...	...	...	ditto	...	...	2	0	0	2	3	6
3	Ditto	...	...	...	ditto	...	...	2	0	0	2	3	6
4	Ditto	...	...	...	ditto	...	...	2	0	0	2	3	6
5	Ditto	...	...	...	ditto	...	...	2	0	0	2	3	6
6	Ditto	...	...	...	ditto	...	...	2	0	0	2	3	6
7	Ditto	...	...	...	ditto	...	...	1	0	0	1	3	6
8	Ditto	...	...	...	ditto	...	...	0	10	0	0	13	6
9	Ditto	...	...	...	ditto	...	...	0	10	0	0	13	6
TOTALS				...				£14	0	0	£15	11	6

APPENDIX 14.

NOTIFICATION OF INFECTIOUS DISEASES RECEIVED FROM 1ST JULY, 1911, TO 30TH JUNE, 1912.

Notifiable Disease.													Notifications Received.
Diphtheria	...	...	...	...	...	...	...	...	...	...	...	...	1,496
Erysipelas	...	...	...	...	...	...	...	...	...	...	...	...	132
Membranous croup	...	...	...	...	...	...	...	...	...	...	...	...	8
Puerperal fever	...	...	...	...	...	...	...	...	...	...	...	...	25
Phthisis	...	...	...	...	...	...	...	...	...	...	...	...	474
Scarlet fever	...	...	...	...	...	...	...	...	...	...	...	...	154
Typhoid fever	...	...	...	...	...	...	...	...	...	...	...	...	1,501
Cerebro-spinal meningitis	...	...	...	...	...	...	...	...	...	...	...	...	5
Ankylostomiasis	...	...	...	...	...	...	...	...	...	...	...	...	31
Relapsing fever	...	...	...	...	...	...	...	...	...	...	...	...	1
Infantile Paralysis	...	...	...	...	...	...	...	...	...	...	...	...	5
TOTAL				...	...	...	...	...	...	...	...	...	3,832

APPENDIX 15.

DISTRIBUTION OF CASES OF INFECTIOUS DISEASES NOTIFIED FROM THE BRISBANE METROPOLITAN AREA, 1ST JULY, 1911, TO 30TH JUNE, 1912.

Local Authorities.				Typhoid Fever.	Scarlet Fever.	Puerperal Fever.	Diphtheria.	Erysipelas.	Phthisis.	Ankylos- tomiasis.	Total.
Brisbane	...	...	...	208	17	3	92	27	133	5	485
South Brisbane	...	...	...	106	29	2	84	12	67	...	300
Ithaca	...	...	...	68	14	1	41	16	34	...	174
Windsor	...	...	...	31	6	...	31	3	9	...	80
Taringa	...	...	...	3	3	...	3	1	2	...	12
Enoggera	...	...	...	2	1	...	...	...	1	...	4
Sandgate	...	...	...	6	4	...	1	1	1	...	13
Balmoral	...	...	...	3	...	1	16	3	...	...	23
Wynnum	...	...	...	3	2	...	16	1	1	...	23
Toombul	...	...	...	20	4	2	15	2	5	...	48
Toowong	...	...	...	26	3	...	14	4	10	...	57
Kedron	...	...	...	5	2	1	4	2	2	2	18
Yeerongpilly	...	...	...	2	...	...	4	...	1	...	7
Coorparoo	...	...	...	...	3	...	4	1	...	...	8
Hamilton	...	...	...	13	5	...	19	4	3	...	44
Sherwood	...	...	...	13	...	1	3	...	5	...	22
Belmont	...	...	...	...	1	...	1	...	...	...	2
Indooroopilly	...	...	...	1	...	...	2	2	...	...	5
Stephens	...	...	...	8	1	...	12	...	5	...	26
TOTAL NO. REPORTED				518	95	11	362	79	279	7	1,351
By Hospitals				197	29	...	287	47	175	4	739
By Medical Practitioners				321	66	11	75	32	104	3	612



## APPENDIX 16.

## CLASSIFICATION OF CASES IN THE LEPER LAZARET, PEEL ISLAND, DURING THE YEAR ENDING 30TH JUNE, 1912.

No.	Sex.	Age.	Nationality.	Occupation.	Form of Disease.	Place of Residence whence Admitted	Date of Segregation.	Dead.	Remain- ing.
1	Male ...	29	Queenslander ...	Nil ...	Nodular ...	Charters Towers ...	22-9-98	..	1
2	Female	19	ditto ...	ditto ...	Tuberculo anæsthetic ...	Townsville ...	6-6-02	..	1
3	Male ...	44	Aboriginal ...	Stockman ...	Anæsthetic ...	Boulia Downs ...	22-10-03	1	..
4	Male ...	77	English ...	Bullock-driver ...	Tuberculo anæsthetic ...	Brisbane ...	21-11-03	..	1
5	Male ...	32	Queenslander ...	Farmer ...	Nodular ...	Mungar (Maryborough) ...	23-12-03	..	1
6	Female	47	New South Wales ...	Domestic duties ...	ditto ...	Mackay ...	13-4-04	1	..
7	Male ...	32	Half-caste ...	Labourer ...	Tuberculo anæsthetic ...	Myora ...	4-10-04	*	..
8	Male ...	37	Queenslander ...	Shearer, &c. ...	Anæsthetic ...	Amby Downs ...	7-11-04	..	1
9	Male ...	35	Kanaka ...	Plantation hand ...	Tuberculo anæsthetic ...	Bundaberg ...	8-9-05	1	..
10	Male ...	35	ditto ...	ditto ...	Nodular ...	ditto ...	8-9-05	..	1
11	Male ...	67	Italian ...	Tobacco planter ...	Anæsthetic ...	Cairns ...	1-3-06	..	1
12	Male ...	40	Chinese ...	Plantation hand ...	Nodular ...	Ayr ...	1-3-06	..	1
13	Male ...	49	Cingalese ...	ditto ...	Tuberculo anæsthetic ...	Cairns ...	1-3-06	..	1
14	Male ...	21	Queenslander ...	Nil ...	Nodular ...	Croydon ...	8-5-06	1	..
15	Male ...	51	German ...	Blacksmith ...	Anæsthetic ...	Brisbane ...	11-6-06	..	1
16	Male ...	42	Kanaka ...	Lobourer ...	Tuberculo anæsthetic ...	Bundaberg ...	26-7-06	1	..
17	Male ...	71	Chinese ...	ditto ...	ditto ...	Rockhampton ...	3-11-06	..	1
18	Male ...	34	Kanaka ...	Plantation hand ...	Nodular ...	Bundaberg ...	16-11-06	..	1
19	Male ...	27	ditto ...	ditto ...	ditto ...	ditto ...	21-1-07	..	1
20	Male ...	31	ditto ...	ditto ...	ditto ...	Johnson River ...	21-1-07	..	1
21	Male ...	37	Aboriginal ...	Labourer ...	Anæsthetic ...	Geraldton ...	19-3-96	1	..
22	Male ...	35	Kanaka ...	Labourer ...	Tuberculo anæsthetic ...	Mackay ...	2-6-99	1	..
23	Male ...	47	ditto ...	Farmer ...	Anæsthetic ...	ditto ...	7-2-00	..	1
24	Male ...	52	ditto ...	Labourer ...	Tuberculo anæsthetic ...	Townsville ...	15-5-03	..	1
25	Male ...	49	ditto ...	ditto ...	ditto ...	ditto ...	15-5-03	..	1
26	Male ...	43	ditto ...	Plantation hand ...	ditto ...	Johnstone River ...	5-2-04	..	1
27	Female	40	ditto ...	Farm hand ...	Nodular ...	Childers ...	23-11-04	..	1
28	Male ...	43	ditto ...	Plantation hand ...	ditto ...	Johnstone River ...	10-4-05	..	1
29	Male ...	31	Queenslander ...	Stockman ...	ditto ...	Cooktown ...	24-7-07	..	1
30	Male ...	24	ditto ...	Farmer ...	ditto ...	Cairns ...	24-7-07	..	1
31	Female	18	ditto ...	Nil ...	ditto ...	Charters Towers ...	24-7-07	..	1
32	Female	29	ditto ...	Nil ...	ditto ...	ditto ...	24-7-07	..	1
33	Male ...	45	Kanaka ...	Plantation hand ...	ditto ...	Cairns ...	24-7-07	1	..
34	Male ...	45	ditto ...	ditto ...	Tuberculo anæsthetic ...	Burdekin River ...	24-7-07	..	1
35	Male ...	50	ditto ...	ditto ...	Nodular ...	Halifax ...	24-7-07	..	1
36	Male ...	41	Queenslander ...	Tailor ...	ditto ...	Brisbane ...	12-8-07	..	1
37	Male ...	42	English ...	Farmer ...	Tuberculo anæsthetic ...	Nambour ...	11-3-08	..	1
38	Male ...	16	Queenslander ...	Schoolboy ...	ditto ...	Brisbane ...	1-4-08	..	1
39	Male ...	42	Kanaka ...	Labourer ...	ditto ...	Nambour ...	30-7-08	..	1
40	Female	62	Scotch ...	Domestic duties ...	ditto ...	Rockhampton ...	8-8-08	..	1
41	Male ...	27	Half-caste aboriginal ...	Labourer ...	ditto ...	Baramba ...	8-8-08	..	1
42	Male ...	26	Half-caste kanaka ...	Stockman ...	Nodular ...	Duaringa ...	30-10-06	..	1
43	Male ...	40	Queenslander ...	Barman ...	Tuberculo anæsthetic ...	Gilliat, North Queensland	10-12-08	..	1
44	Male ...	44	Kanaka ...	Labourer ...	Nodular ...	Mackay ...	10-12-8	1	..
45	Male ...	42	Japanese ...	ditto ...	Tuberculo anæsthetic ...	Proserpine ...	10-12-8	1	..
46	Male ...	32	Chinese ...	Gardener ...	ditto ...	Tully River ...	10-12-8	..	1
47	Male ...	44	Aboriginal ...	Nil ...	ditto ...	Ducie River, N. Q.	10-12-8	..	1
48	Male ...	42	ditto ...	Nil ...	Anæsthetic ...	Cape York Peninsula	10-12-8	..	1
49	Male ...	27	ditto ...	Nil ...	Tuberculo anæsthetic ...	ditto ...	10-12-8	..	1
50	Male ...	27	ditto ...	Nil ...	Nodular ...	Daintree River ...	10-12-8	..	1
51	Male ...	27	ditto ...	Nil ...	Anæsthetic ...	Cape York Peninsula	10-12-8	..	1
52	Female	39	ditto ...	Domestic duties ...	Tuberculo anæsthetic ...	Moreton Telegraph Station	10-12-8	..	1
53	Female	32	ditto ...	Nil ...	ditto ...	ditto ...	10-12-8	..	1
54	Female	26	ditto ...	Nil ...	ditto ...	Jardine River ...	10-12-8	1	..
55	Female	42	ditto ...	Nil ...	ditto ...	Cape York Peninsula	10-12-8	..	1
56	Female	44	ditto ...	Nil ...	ditto ...	ditto ...	10-12-8	..	1
57	Male ...	52	Kanaka ...	Labourer ...	ditto ...	Cairns ...	17-9-9	1	..
58	Male ...	37	Queenslander ...	ditto ...	ditto ...	Normanton ...	21-12-9	1	..
59	Male ...	13	Half-caste aboriginal ...	Nil ...	ditto ...	Southport ...	24-2-10	*	..
60	Male ...	13	ditto ...	Nil ...	ditto ...	ditto ...	24-2-10	*	..
61	Male ...	31	ditto ...	Labourer ...	ditto ...	Eidsvold ...	23-3-10	..	1
62	Male ...	33	Aboriginal ...	ditto ...	ditto ...	Cairns ...	17-4-10	..	1
63	Male ...	13	Queenslander ...	Schoolboy ...	Nodular ...	Brisbane ...	8-7-10	..	1
64	Male ...	36	Kanaka ...	Labourer ...	Tuberculo anæsthetic ...	Nambour ...	18-9-10	..	1
65	Female	22	Queenslander ...	Tailoress ...	ditto ...	Mackay ...	27-3-11	..	1
66	Male ...	21	ditto ...	Nil ...	ditto ...	Rockhampton ...	13-4-11	..	1
67	Male ...	51	Kanaka ...	Labourer ...	ditto ...	Mackay ...	8-6-11	..	1
68	Male ...	16	Queenslander ...	Schoolboy ...	ditto ...	Dunwich ...	25-5-11	..	1
69	Male ...	51	New South Wales ...	Farmer ...	ditto ...	Crow's Nest ...	20-6-11	..	1
70	Male ...	50	Kanaka ...	Labourer ...	ditto ...	Mackay ...	14-9-11	..	1
71	Male ...	38	Queenslander ...	Butcher ...	Nodular ...	Miriam Vale ...	10-11-11	..	1
72	Male ...	52	Irish ...	Farmer ...	Tuberculo anæsthetic ...	Rockhampton ...	25-4-12	..	1
73	Male ...	?	Kanaka ...	Nil ...	Anæsthetic ...	Friday Island ...	7-2-00	..	1

\* Discharged.

## SUMMARY.

Remaining in Lazaret on 30th June, 1911	...	69
Admitted from 1st July, 1911, to 30th June, 1912	...	4
Total	...	73
Discharged from 1st July, 1911, to 30th June, 1912	...	3
Died during the same time...	...	13
Total	...	16
Number remaining on 30th June, 1912	...	57

Price, 3s. 3d.

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